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# THE PAPER INDUSTRY

A MONTHLY EDUCATIONAL JOURNAL MARCH, 1934

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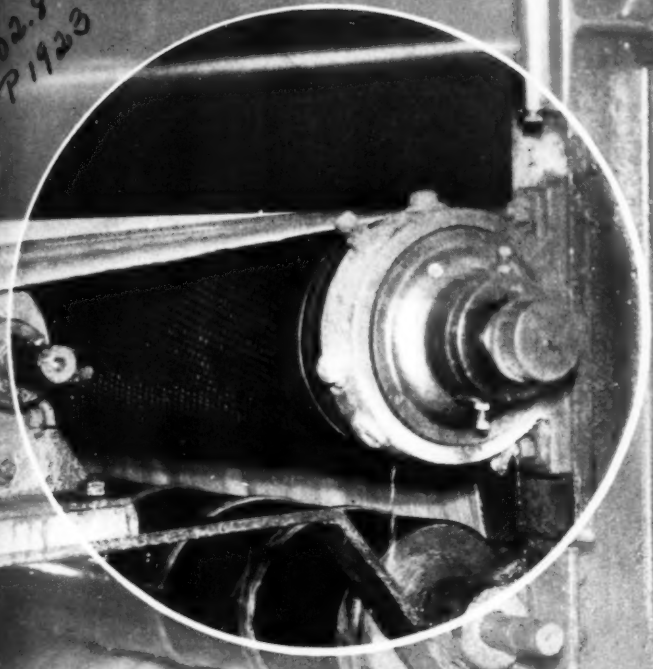

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*Name of this mill and other users sent on request . . . The Downingtown Mfg. Co., Downingtown, Pa.

DOWNINGTOWN SUCTION FELT ROLL

# GOOD FELTS

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Only the highest grade of pure wool, manufactured in a plant where every step in the process of manufacture is checked and rechecked, can produce GOOD FELTS. That's the first reason why Appleton Felts are good felts---a fact you can prove yourself. Solve your felt problems with Appleton Felts.

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In hundreds of industrial plants managing executives are racking their brains to cut costs. Yet in many such plants there is opportunity to save thousands of dollars yearly in one department—the steam and power department.

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In some cases installation of suitable stokers may permit use of a cheaper fuel. In others a high pressure boiler and turbine may virtually eliminate power cost, while reducing the cost of process steam. In still others a number of small, inefficient boilers may be replaced by one large, modern unit, with large fuel savings.

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*Canadian Associates, Combustion Engineering Corp., Ltd., Montreal*

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COMBUSTION ENGINEERING COMPANY, INC., 200 MADISON AVENUE, NEW YORK

*Please send me details of your plan for assisting me in determining how much my present steam costs can be reduced.*

*Name*_____ *Title*_____

*Company*_____

*Address*_____

5

# THE PAPER INDUSTRY

MARCH, 1934
Vol. XV—No. 12

A MONTHLY EDUCATIONAL JOURNAL
Devoted to the Interests of the Pulp and Paper Industry


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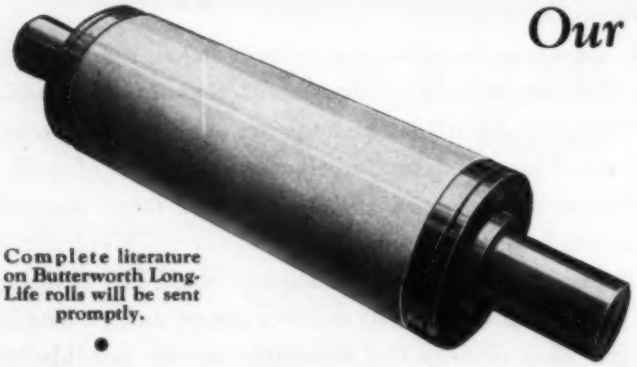

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*Our Customers Created the Name . .*

"LONG-LIFE" ROLLS

You can prove why they are called "Long-Life" Rolls right in your own plant, by putting just one roll in the stack with any other roll or set of rolls. Then time them—that's all. In addition to being made of materials especially selected for the purpose, these Butterworth Long-Life rolls have heads and shafts of forged steel. Taper wedges are used and Butterworth Long-Life Rolls *never* come loose on the shaft.

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*Established 1820*
PLANTS at PHILADELPHIA and BETHAYRES, PA.

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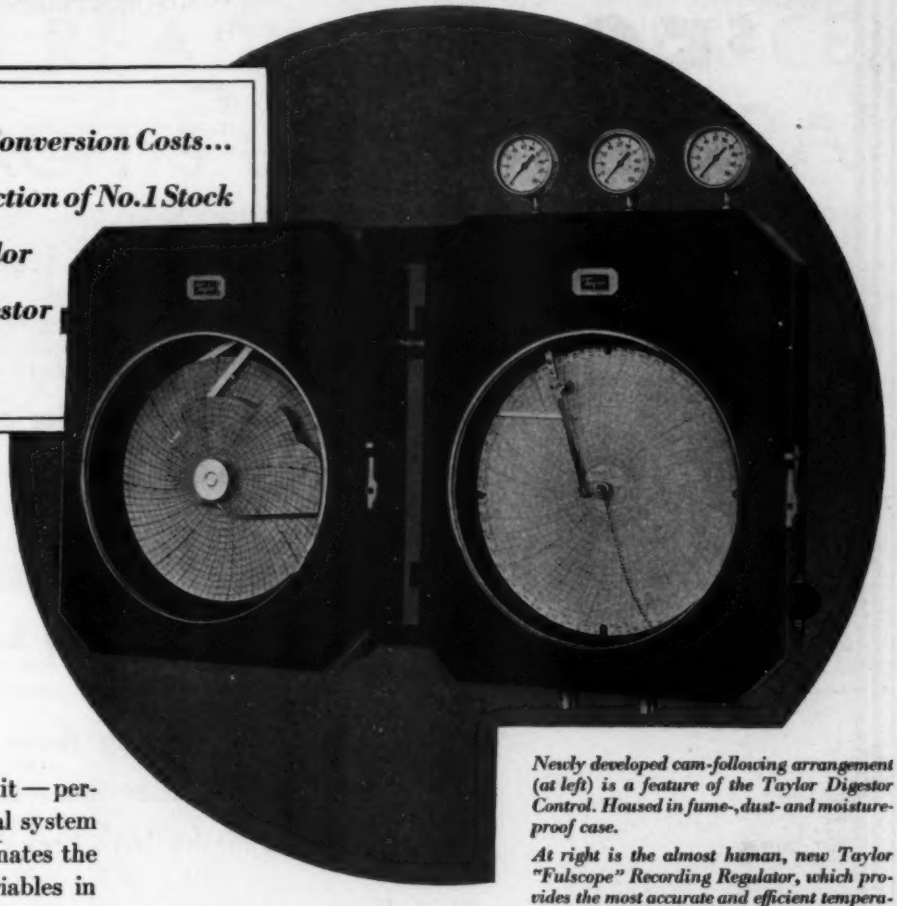
• BUTTERWORTH *Calender* ROLLS •

# NEW EFFICIENCY FOR SULPHITE DIGESTORS

***Obtain Lower Conversion Costs... Increase Production of No. 1 Stock with This Taylor Automatic Digestor Control***



*Newly developed cam-following arrangement (at left) is a feature of the Taylor Digestor Control. Housed in fume-, dust- and moisture-proof case.*

*At right is the almost human, new Taylor "Fulscope" Recording Regulator, which provides the most accurate and efficient temperature and pressure control obtainable.*

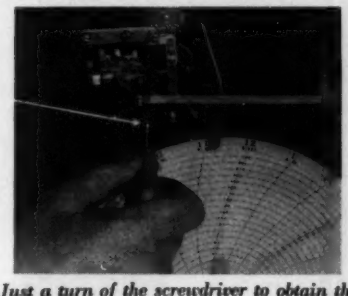
TAYLOR has done it—perfected a simple, practical system that controls and coordinates the two most important variables in your cooking cycle—temperature and pressure.

Taylor Control of Sulphite Digestors is entirely automatic over 90% of the cooking cycle. It enables your plant to schedule cooking operations within a few minutes. It insures the production of uniformly high quality stock.

This exact spacing of cooking cycles means savings to your steam plant. "Tailing" losses are reduced to the minimum. The bleaching qualities of your stock are so improved that you make real savings in bleaching chemicals, too. By eliminating many manual operations, operators are freed to handle other details of the job more efficiently. Taylor Automatic Digestor Control raises the efficiency of your whole digestor operation.

Nothing has been overlooked. Even variations in gas pressure are automatically compensated for in the steam flow control. Maximum gas is diverted to the reclaiming system before the digestor is blown, through relief valve control.

The Taylor Digestor Control System is easily adapted to all standard vertical-type digestors using direct steam supply method. Send today for further information. Taylor Instrument Companies, Rochester, New York, or Toronto, Canada.



*Just a turn of the screwdriver to obtain the one best sensitivity for a given process. This sensitivity control is just one of 8 advantages in the new Taylor "Fulscope" Recording Regulator.*

Taylor

Indicating | Recording • Controlling

TEMPERATURE *and* PRESSURE

INSTRUMENTS

# $500
# REWARD

It is illegal outside the Irish Free State to print Irish Hospitals' Sweepstake Tickets or Receipt Blanks, or to manufacture or use for printing, paper watermarked, or purporting to be so watermarked, with the words

**PAPER WARRANTED MADE IN IRELAND BY SWIFT BROOK PAPER MILLS LIMITED**

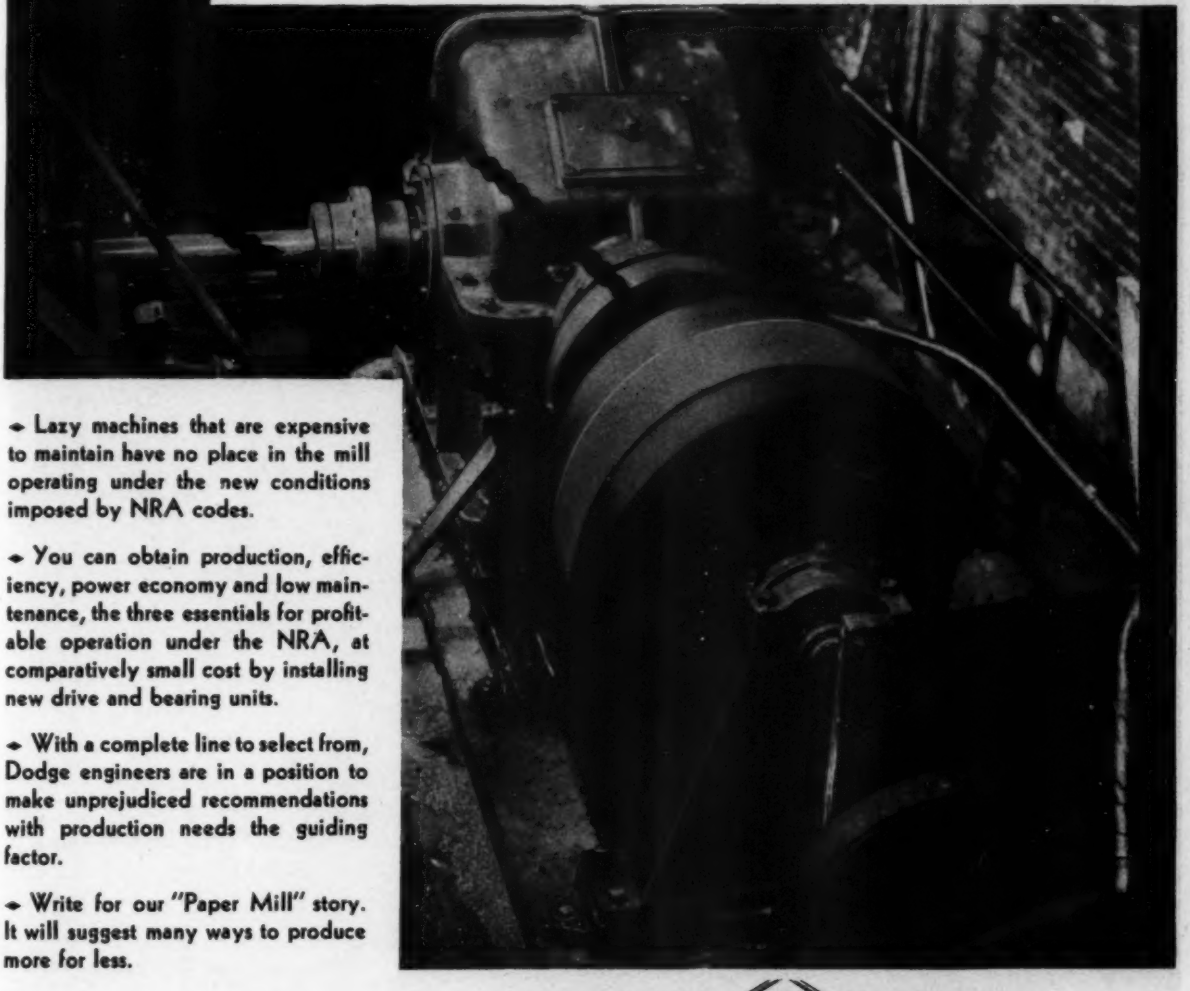
All copyrights respecting these printings and watermarked paper are vested only in certain firms in the Irish Free State.

The above-mentioned reward will be paid to the person supplying me or the local police with the first information leading to a successful prosecution for violation of these copyrights.

**PHILIP O'REILLY, Solicitor**
**Bank Buildings**
**1 Upper Ormond Quay**
**Dublin**
**IRISH FREE STATE**

ONLY LETTERS CONCERNING THIS REWARD SHOULD BE SENT TO THE ABOVE ADDRESS

# NOW · THIS MACHINE IS READY TO PRODUCE PROFITS UNDER THE NRA



- Lazy machines that are expensive to maintain have no place in the mill operating under the new conditions imposed by NRA codes.

- You can obtain production, efficiency, power economy and low maintenance, the three essentials for profitable operation under the NRA, at comparatively small cost by installing new drive and bearing units.

- With a complete line to select from, Dodge engineers are in a position to make unprejudiced recommendations with production needs the guiding factor.

- Write for our "Paper Mill" story. It will suggest many ways to produce more for less.

*You can get all three at small cost*

❶ Production Efficiency
❷ Power Economy
❸ Low Maintenance

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MISHAWAKA
THE *Right* DRIVE FOR EVERY JOB

DODGE MANUFACTURING CORPORATION • MISHAWAKA, INDIANA

**"We are very well pleased with these machines. They solved a rather difficult beating problem for us." This is what the Manager of the National Paper Products Company writes about the Six Fritz Refining and Hydrating Machines in their plant at Port Townsend, Washington. These machines have helped this company to make better paper at a lower cost than they could by other methods, for five years. If you want to get the same result, write us. LOVE BROTHERS, INCORPORATED, Aurora, Illinois.**

## PONTAMINE FAST RED 8BL

If you are looking for pink, red and maroon shades of good light fastness, investigate PONTAMINE Fast Red 8BL. It is fast to light, bluish red in shade, high in tinctorial power and suitable for all papers.

This du Pont dyestuff is a very good shading color in combination with Du Pont Brilliant Paper Yellow Conc., and Du Pont Anthraquinone Blue B for russet and gray bonds.

If you do not already have a sample of PONTAMINE Fast Red 8BL, send for it now.

DU PONT DYESTUFFS
REG. U.S. PAT. OFF.

**E. I. DU PONT DE NEMOURS & CO., INC.**
*Organic Chemicals Dept.*
**DYESTUFFS DIVISION, WILMINGTON, DELAWARE**

# "Appleton Wires Are Good Wires"

**The leadership of Appleton Wires is maintained by constant research and development. The latest improvement offered the paper industry is found in Appleton Phosaloy Fourdrinier Wires with the**

**APP-WELD**
PATENTED
**SEAMLESS JOINT**

WRITE FOR SAMPLES

**THE APPLETON WIRE WORKS, Inc.**

APPLETON, WISCONSIN, U. S. A.

U. S. Patent No. 1895605. Others Pending

BRINGS ADDED LIFE TO APPLETON PHOSALOY FOURDRINIER WIRES

# It Was a Great Convention!

WHAT a gathering!

Never before in the history of the industry has such a gathering of paper men assembled in any place or at any time as that which met in New York last month for the 57th Annual Convention of the Paper Industry.

And what a contrast!

A year ago, comparatively a mere handful of manufacturers and merchants met in New York—a grim body of gritty, never-say-die representatives, the remnants of a shattered army of fighting mill men and associates, battered and worn with the unsuccessful fight against the cohorts of chiselers and bankruptcy. Dejected, palsied, but determined to carry on, they adjourned to go back and fight what to them at that moment, looked like a chaotic question mark.

And this year they came back—phalanx upon phalanx; from every section of the country they literally poured into New York. At early afternoon of February 19 the immense Waldorf-Astoria Hotel, with its 2800 rooms filled, turned hundreds away

Never have divisional, technical operating and merchandising meetings been so handsomely attended. Men jammed the halls and thronged the corridors, all seeking information or contributing by their presence and counsel to the perfecting of the codes of fair practice and the adoption of the Trade Customs over which, the leaders of the industry in co-operation with the administration authorities had labored the past eight months.

There was new light in their eyes. Their heads were up and their chins were thrust out. They were filled with a new confidence. They were there to see that no shadow of doubt should cloud the good beginning of the new deal in the paper industry.

Of course, there were matters to iron out and controversial questions to settle. However, these questions were all approached and considered from the standpoint of what is for the greatest good to the greatest number. Never in all our many years of attendance at these annual conventions was there demonstrated such a splendid spirit of "give and take." For there is abroad in the industry the conviction that all attempts to use the codes for a special individual or special group preferment, are out, checked off and useless. Decisions are to be made only after thorough consideration of all germane facts and in strict accordance therewith.

Not a single paper man could be found worrying about the maintenance of announced and published price levels. Minimum price levels must be maintained, if every member of the industry has to turn policeman to enforce their continuance.

There was no foolish indulgence in elusive optimism. On every hand in each division, it was realized that the NRA was not an end, but simply a means to an end. We had finished nothing—the job had only begun.

And, finally, these fighting paper men went back home at the end of a most historic week of day and night conferences, determined each one in his particular field to do his best to hasten the return of stabilized profitable paper business.

It was a great convention!

# + EDITORIAL +

## Market Created by Outside Influences

EMPHASIS has been placed upon the necessity of creating new uses for paper by many of the industry's leading executives during the past few years. Perhaps in some instances, this suggestion has come as a result of dwindling markets in an over-expanded industry, but in others it may have resulted from the rapid increase in the so-called mechanical uses of paper during the past quarter of a century.

Whatever the reason for suggesting such action on the part of the industry may have been, it is based on sound logic. There is, however, the ever present need of placing additional effort in the merchandising of standard lines. After all, these lines have been the bread and butter to the majority of mills and for several years past the bread has been rather thinly buttered for some of them.

It is believed that the manufacturers of insulation and building board might be cited as a case in point. With the slump in general business came a rapid decline in the construction of new buildings and modernization of old ones. The building trades were at a standstill and little opportunity existed for merchandising insulation and building board in any profitable volume. Some of the manufacturers of these products saw a temporary opportunity to profit during the days of the jig-saw puzzle craze, and made the best of their opportunity. Others have probably been biding their time, hoping against hope that better business would come before it was too late.

Increased activity in the building trades no doubt would immediately be felt by the manufacturers of insulation and building boards, and perhaps the spring of 1934 may see a revitalization of building activities. If it should not, it is believed that there are urban centers of population where concentrated sales effort would result in an increased outlet for these standard lines.

For the past few years, for example, it is understood that extensive sales campaigns have been run in such cities as Rochester, N. Y., St. Louis, Kansas City, Detroit, and more recently in Chicago to merchandise gas heat for home heating. Many homes in these centers have already been equipped to heat with gas, and many others will be equipped.

One of the sales problems with which gas heating engineers have been confronted is that of poor insulation. Naturally, this is an important problem whether the home is heated with gas or some other fuel, but the cost of gas heat for a poorly insulated home is often prohibitive.

It should be pointed out that the use of gas heat should prove a boon not only to the manufacturer of insulation materi ', but to the building board manufacturer as well. With the installation of gas heat in a home, basement space can be utilized practically for an extra room or two—maybe a playroom, gymnasium, or den. Whatever the use, it suggests a market for building board.

Why not check on the cities where gas heat sales programs are now in progress and for a time concentrate sales activities in such of these cities as might seem most propitious. Give thought to better dealer co-operation, to direct mail advertising, and to suitable representation in leading newspapers in the selected areas, either as an individual advertiser or as a group advertiser allying yourself with competition.

## Read the Advertising

IF questioned directly, it is believed that many leading executives in the pulp and paper industry would have no hesitancy in crediting the business paper—more specifically the trade paper devoted to the field in which they have become leaders—as one of the contributing factors in their success. No doubt most of them would state that through the articles and news features contained in the various publications which they had and were reading, it had been possible for them to keep abreast of all major developments. In other words, the editorial material of these publications had kept them informed.

In addition to the editorial matter, however, has been the advertising messages of many of the leading firms doing business with the industry. These messages within recent years have in the majority of cases become very informative and have made available to the reader a vast fund of factual data.

The advertising pages not only tell where various items may be purchased, but frequently record most recent developments by leading manufacturers serving the industry. They may record an improved design of machine or machine part; describe some improvement in the manufacture of a chemical raw material which makes its use easier; or reveal how generating and power transmission efficiencies might be increased. In fact, these pages might be said to be filled with facts and ideas which when utilized would help to reduce production costs and to improve manufacturing conditions within the industry.

Read the advertising pages in the magazines which you enjoy. You will find the time spent in doing it will be both pleasant and profitable.

# Install
# DAYTON COG-BELT DRIVES

**. . . They last longer**
**. . . They save space**
**. . . They are rugged**
**. . . Clean . . . Quiet**

Dayton Cog-Belt Drives meet the demand for more efficient power transmission—for more rugged drives—for drives with longer life—for drives that are clean and quiet and that require less space. Their superiority is due to many exclusive advantages found only in Dayton Cog-Belts—*the logical and correct V-Belts for all power transmission requirements.*

Send for a free sample section of a Dayton Cog-Belt and see for yourself how this remarkable belt is superior to all others. Write today.

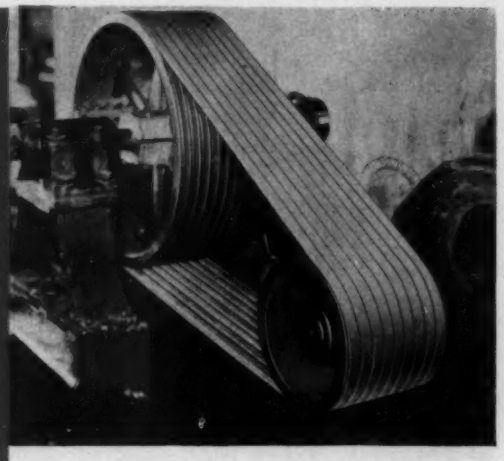
THE DAYTON RUBBER MFG. CO., DAYTON, OHIO

*Factory Distributors in Principal Cities and all Westinghouse Electric and Manufacturing Company Sales Offices*

# Dayton

**COG-BELT DRIVES**

Also manufacturers of Dayton Fan Belts . . . Dayton Red Tube Radiator Hose . . . and famous Dayton Thorobred Tires and Tubes



## Note the Revolutionary Construction of the Dayton Cog-Belt

**1** The outer section gives balance. Composed of numerous layers of vulcanized, strong bias-cut cord fabric. Bias-cut to accommodate bending without strain or distortion. This is another reason why Daytons don't heat and last longer than other belts.

*Cross Sectional View*

**2** The *"Neutral axis"*, or *strength* section, extends across the entire width of the belt. Die-cut and pre-stretched *permanently* by a patented and exclusive Dayton process. That's why Daytons have a firmer grip, smoother action, and require less servicing in adjustments.

**3** The cog *construction* permits Dayton Cog-Belts to flex naturally and easily around even the smallest pulleys without distortion, buckling or rippling. Dayton's cog construction is an exclusive feature. It is found *only* in Dayton Cog-Belts.

*Side View*

**Complete Drives—Pulleys and Belts—in stock—all ratios 2 H. P. to 100 H. P.**

# Harvesting Depression Thoughts

By WILLIAM SIBLEY

LAST month, writing in this place, I stated that many industrial developments of a far-reaching order have been accumulating and right now are awaiting the more propitious time of increased purchasing power to be brought to the front and exploited.

There can be no doubt of the truth of that statement. Many improvements, deep-going in their effect upon our social and economic structure, have been developed during the past four years; their exploitation and adoption being prostponed only because of the stringencies of the times. Because this is true, it may also be said that the paper mill or pulp plant that most successfully negotiates the approaching era of business prosperity will be that mill which first recognizes, then adopts, such of these improvements as will make for gain.

Far more might be said on the subject of recent developments. Whole pages could be filled, even if only a catalogue listing was to be given. Such things as stream-lined passenger trains which have neither wheels nor wings, yet which attain a speed of two hundred miles an hour on fifty per cent of the normal electrical energy consumption, are really commonplace reports nowadays. The development of such things as moonlight photography, aluminum mirrors, fog-penetrating lamps, non-glare headlights for automobiles, the broadcasting of electrical power, the radio transmission of heat, and a thousand and one other things are in the immediate offing. Nor are these reports the chimerical imaginings of some cracked dreamer or put out for the purpose of extracting newsstand quarters from over-imaginative youngsters.

Not only is television being developed to a high state of perfection, the exploitation of which is merely awaiting the return of purchasing power, but we soon will be leaving our radio receiving sets on all night (inaudibly, of course) so that during the early morning hours the broadcasting companies may transmit to us the news of the day, which will be printed right in our own individual receiving sets and ready to be torn off the roll of paper and read while enjoying the morning coffee.

The almost unbelievable developments of today will become the realities of tomorrow, and we in the manufacturing business need to realize that fact.

There is another development of recent times, however, which should not be overlooked or underestimated by modern managements. And that is, the abundance of progressive ideas now being nursed in the minds of thousands of men—more especially the unemployed.

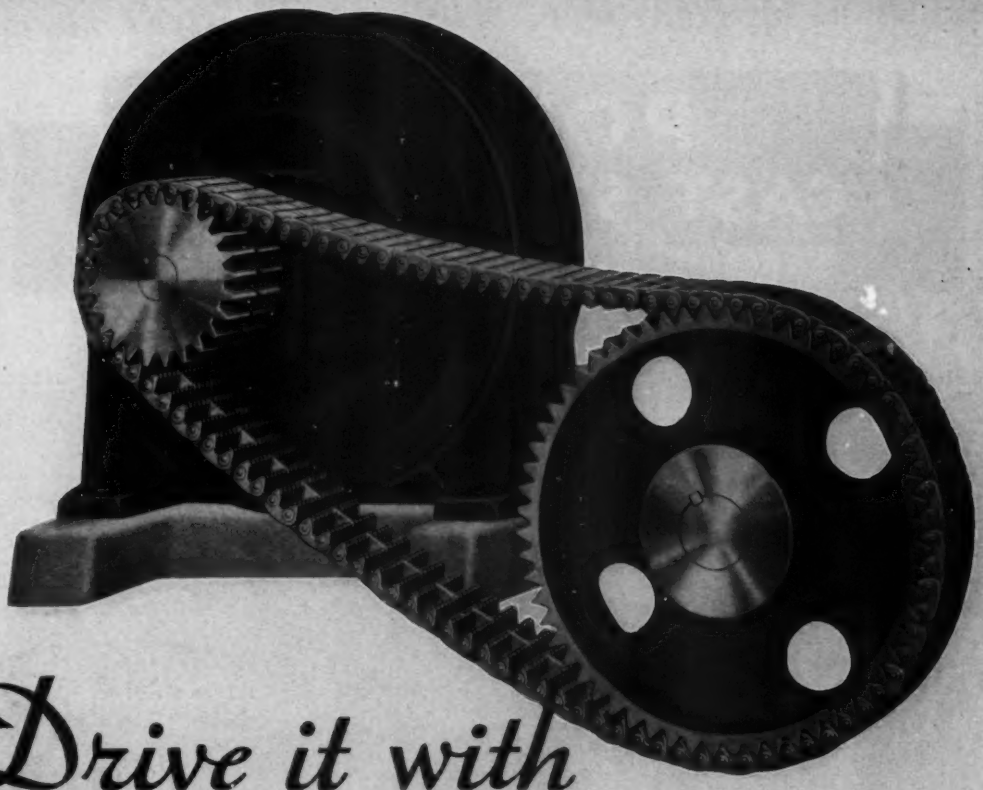
During the past four years many of the hundreds of thousands of unemployed found it necessary to do something to keep soul and body together; to adopt some means for earning enough to provide food and shelter. Former assistant superintendents have been reduced to taking in washing; skilled mechanics have turned to collecting old newspapers and magazines to sell for a few cents; trained advertising men have become freight elevator operators. In all walks of life, literally millions of people have been turned topsy-turvy.

This change, for the great majority, brought with it considerable periods of idle time. And the more constructive-minded of these unemployed have used portions of this time to devise new methods, think of new and better products, or find ways to enlarge markets. And some day those ideas will crystallize into tangible form.

The ideas developed by these unemployed people during the past years may have little or nothing to do with their immediate job, or acknowledged vocations. Furthermore, the age-old law of averages will make a percentage of these ideas absolutely worthless. But the same law will, by the same token, show a certain percentage of them to be highly worthwhile and valuable.

Back in January of 1925 I wrote, in Current Thought: "It pays you to keep your ears open and your mood receptive when a salesman calls. You may not need his goods, but you need all the information you can get out of him. Ask him questions. Listen to him. If you treat salesmen courteously you will learn many practical ideas."

What applied in January of 1925, with respect to traveling salesmen, applies with even greater intensity in March of 1934 with respect to the unemployed you put back on your payroll. Many of the men you will be hiring during the next twelve months will have been out of work for varying lengths of time during the past three or four years. Some of these men will have used that idleness in evolving ideas that you need. It will pay you to harvest them.

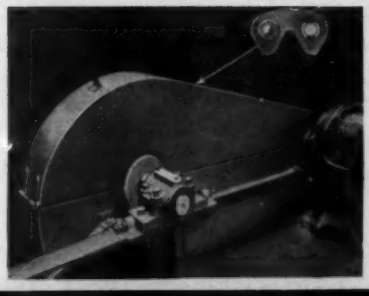


*Drive it with*

# SILENT CHAIN

*for Maximum Efficiency*

Link-Belt Silent Chain continues to be the most efficient, economical, durable, flexible, positive drive on the market. ◆ ◆ ◆ Use Silent Chain, and avoid power, product and production losses through drive slippage. ◆ ◆ ◆ Our improved Double Hat and Washer Type Automatic-Lubricating Casing absolutely prevents oil leakage. ◆ ◆ ◆ Ask for Data Book 125, and Pink List 725 of stock drives.



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**LINK-BELT COMPANY**

INDIANAPOLIS · SAN FRANCISCO · PHILADELPHIA · CHICAGO · TORONTO

*Offices in Principal Cities*

**Use LINK-BELT POSITIVE DRIVES**

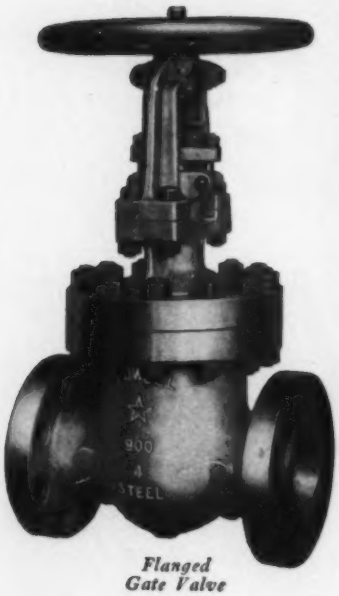
SILENT CHAIN · SILVERLINK ROLLER CHAIN · SPEED REDUCERS

VARIABLE SPEED TRANSMISSION · CHAIN DRIVES (ALL TYPES)

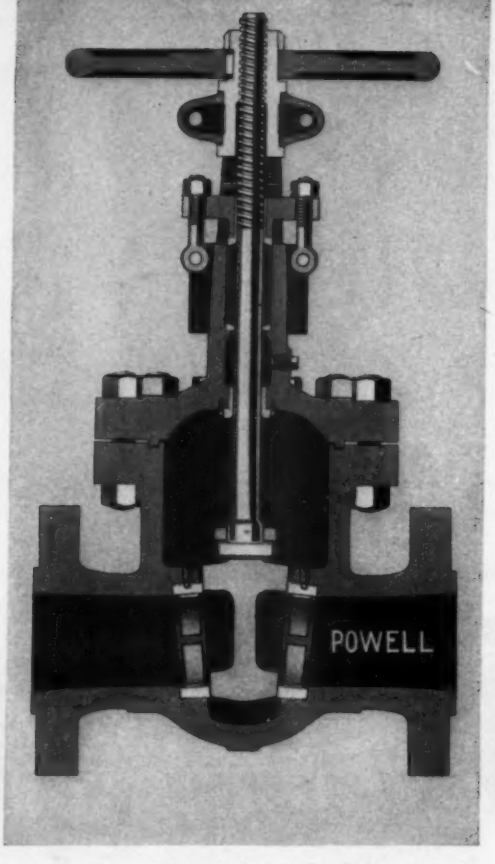
# POWELL
# CAST STEEL VALVES

Excellent workmanship, not alone on the exterior finish but on all interior working parts vital to cast steel valves, is reflected in the lengthy service.

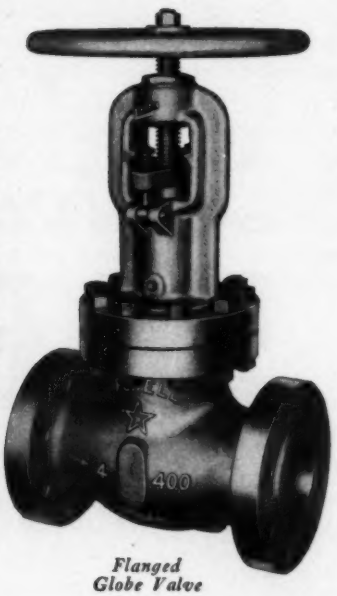
All parts are produced to gauge, are interchangeable, and of equal wearing quality. Modern operating methods and machining facilities insure precision.



*Flanged Gate Valve*




*Flanged Gate Valve Sectional View*




*Flanged Globe Valve*

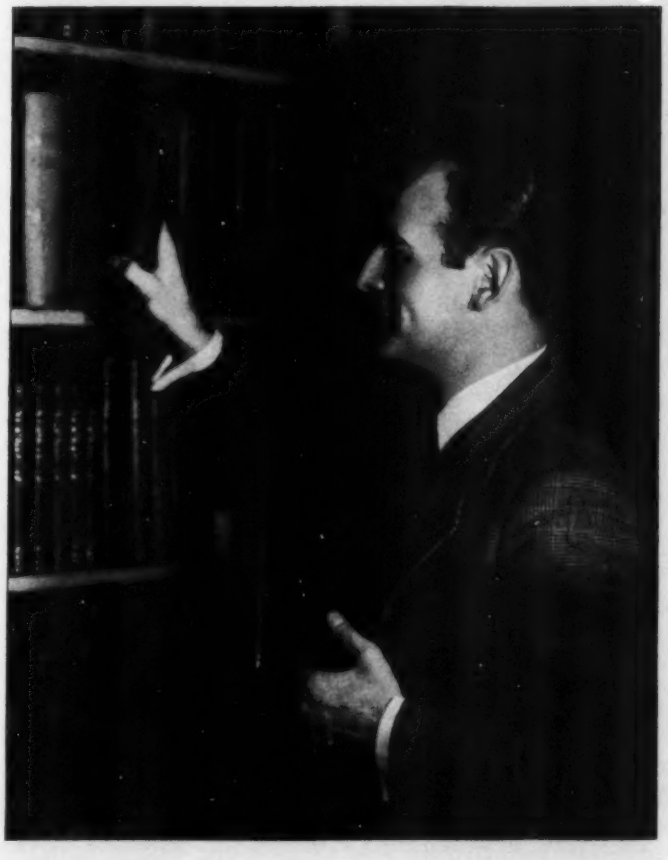
THE same distinctive quality characteristic of Powell products applies to Powell cast carbon and alloy steel valves. Made in gate, globe, angle, check, and safety non-return patterns, sizes range from ⅜ to 30 inches, with working steam pressures ranging from 150 to 1500 pounds. A variety of trim materials permits the use of the material best suited for air, oil, water, gas, or steam service. A newly developed Powell trim material is ideal for extremely high pressures at elevated temperatures.

THE WM. POWELL CO. • 2525 Spring Grove Avenue • Cincinnati, Ohio

**POWELL VALVES**

Seventy-six Years of Experience Make a World of Difference

# You'll never learn this *from* books



THERE'S only one way in which to learn how to make felts and that's to make them. Books can never teach you. Only experience.

Felts aren't made . . . they can't be made . . . by rule of thumb; nor by cut-and-dried practices.

It's only experience that can decide what kind of wool or what combination is best for each type of felt.

It's only experience that will show how to weave it, how large to make it so that it will full down to size.

It's only experience that will tell how to full it so that it will be soft with every fibre strong, able to do its share of the work of paper making.

Experience — seventy-six years of it — is behind every Hamilton Felt. This experience has been handed down from father to son to grandson — the same two families, the same partnership that made Hamilton Felts back in 1858 is still making them today.

Hamilton Felts are marked by two blue lines full width of felt and by one blue line midway between them.

See for yourself what this experience means. Try one Hamilton Felt. You'll buy another and another . . . you'll keep on buying them.

**SHULER & BENNINGHOFEN, Hamilton, O.**

*Miami Woolen Mills* *Established 1858*

**Hamilton Felts**

# Positive Control

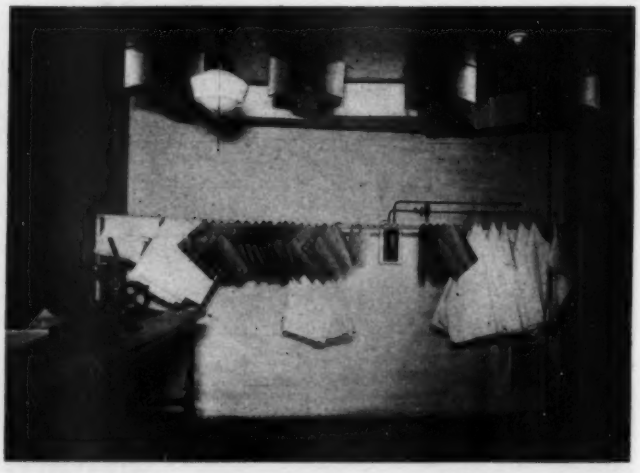
## *of both temperature and humidity for testing laboratories*

*View shows interior of typical insulated paper testing room.*

*Equipment is furnished in several sizes—all adequate to meet outside weather changes.*

*Accurate in results and simple to operate.*

*Economical to install and to maintain.*



# ROSS Conditioning Equipment

*Copy of this Bulletin giving description and helpful data sent upon request.*

Definite test standards are being insisted upon by purchasers of paper. Without positive control of humidity and temperature, test standards must be as irregular as the varying outside weather conditions. The Ross Air Conditioning System insures uniform conditions for testing at all times throughout the entire year. Standard or any intermediate conditions of relative humidities and temperature are easily maintained by a simple and dependable method of control. The equipment including the Ross Conditioning Unit is complete and compact and low enough in cost to enable any mill to maintain definite test standards.

*We invite inquiries from any mill that is considering the installation of a testing laboratory.*

## J. O. ROSS ENGINEERING CORPORATION

**ROSS ENGINEERING OF CANADA, LIMITED**

201 North Wells Street
CHICAGO

Main Office—350 Madison Ave.
NEW YORK

2860 N. W. Front Ave.
PORTLAND, ORE.

A certain paper manufacturer, after considerable experimentation, found a new mix that gave a desired stock at lowest cost. If a wet machine could be built to handle this stock, he could make a special board, then expensive, at a price ridiculously low.

Given the facts, S & W engineers went to work. They designed a new wet machine that insured correct formation in the vats, and a uniform sheet from the cheaper mix. A specially designed feeder overcame trouble from ordinary calendering equipment, cutting those sheets wrinkled from the drying oven. This loss, often as high as 20%, became less than 1%.

We work directly with you and your engineering consultant to design machines for economically turning out a desired paper. All information is held in strict confidence, and is worked out in secrecy.

To help you get acquainted, a booklet, "Carrying the Torch," has been prepared. It tells of our work in designing and building the three largest Fourdriniers operating in the world today on the finest tissue and condenser papers and the engineering and production facilities available at South Windham. A request on your letterhead will bring your copy.

*The* CONSULTING ENGINEER *has a Part in the Picture*

★

# *The* SMITH & WINCHESTER
## *Manufacturing Company*

PLANT AND OFFICES AT SOUTH WINDHAM, CONNECTICUT

# EMCO NORDSTROM VALVES

## have gate valve face-to-face dimensions...

*(unnecessary to alter pipe dimensions)*

Being interchangeable with standard gate valves, the new Emco Nordstrom Lubricated Plug Valves meet a demand in the paper industry. Differing from the standard Nordstrom line of valves, the Emco Nordstrom series has the same face-to-face dimensions as gate valves in the same sizes—available from 2" to 12" inclusive. Thus it is unnecessary to alter pipe dimensions when making replacements. The cost of these superior valves compares favorably with gate valve prices. Embodying patented "Sealdport" lubrication, Emco Nordstrom Valves offer many advantages.

TYPICAL FEATURES: Full-floating, hydraulically lubricated plug; unexposed frictionless resilient packing; elimination of long stuffing box; sealed seat impossible for foreign matter to settle in; quarter-turn, permitting quickest shut-off; plug hydraulically sealed around valve ports with pressure lubricant, assuring positive shut-off and freedom from leaks internally and externally. Most compact housing. Ask for Bulletin V102.

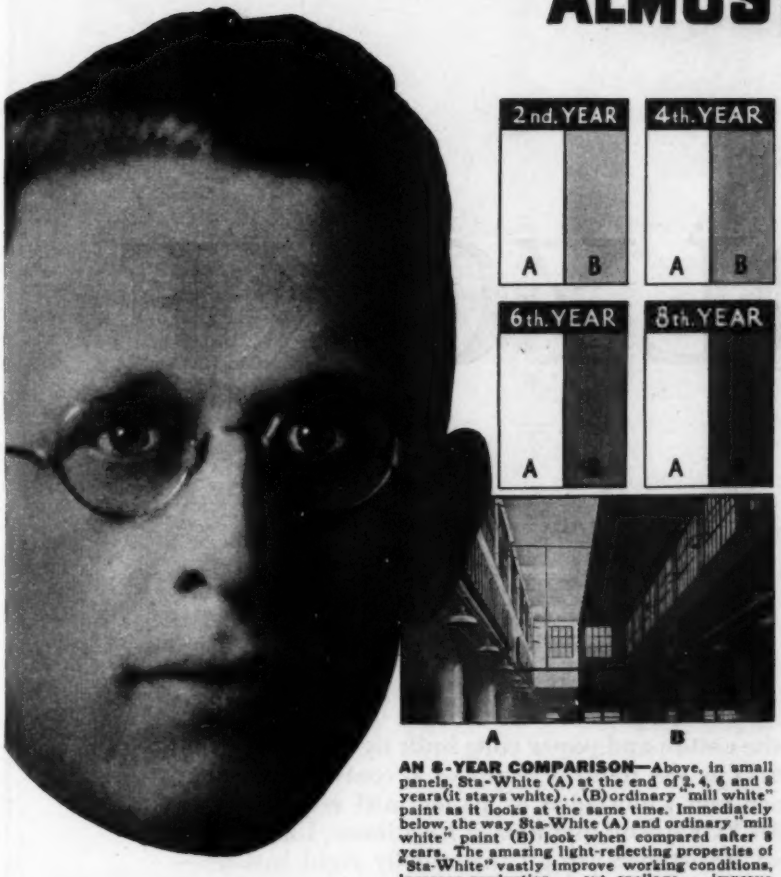
# EMCO NORDSTROM

*Lubricated Plug Valves* WITH GATE VALVE DIMENSIONS

**MERCO NORDSTROM VALVE COMPANY** *A Subsidiary of* **PITTSBURGH EQUITABLE METER CO.**

Main Offices: Pittsburgh, Penna. Branch Offices and Warehouses in Principal Cities

# *Amazing* DISCOVERY CUTS COST OF MILL WHITE PAINT ALMOST IN HALF








A B

**AN 8-YEAR COMPARISON**—Above, in small panels, Sta-White (A) at the end of 2, 4, 6 and 8 years (it stays white)...(B) ordinary "mill white" paint as it looks at the same time. Immediately below, the way Sta-White (A) and ordinary "mill white" paint (B) look when compared after 8 years. The amazing light-reflecting properties of "Sta-White" vastly improve working conditions, increase production ... cut spoilage ... improve morale. Write for details.

IMAGINE a paint that gives twice as much value for every dollar you spend! The very idea is startling. Yet a unique discovery by one of America's leading paint manufacturers now makes these savings possible for paint buyers everywhere.

The process by which this discovery is applied to mill white paint manufacturing produces a film of amazing lasting qualities . . . a pure white paint that will not "yellow with age" . . . that stays white as long as 10 years, or more.

### *Light Reflection Power*

Because of the way this film "sets", this new type of paint . . . known as "Sta-White" . . . has unusual light-reflecting qualities . . . greater hiding power . . . and gives 30% greater coverage than "ordinary" mill whites applied under the same conditions.

Facts about this money-saving paint and what it means will be gladly sent to any paint user. Paint buyers are also invited to write for a new kind of "Paint Chart" that shows instantly the correct type of paint needed for every job.

## THIS STARTLING NEW CHART NOW OFFERED FREE!

A new "Easy-Way Paint Chart" has been developed by the Detroit Graphite Company. A complete . . . easy-to-use . . . compact guide that tells the correct paint to use for each job. What to use for structural steel and other metals . . . for tanks, stacks, roofs, floors . . . all kinds of paint jobs. It's free. Just mail the coupon.

## DEGRACO PAINTS VARNISHES ENAMELS

Offices and Warehouses in Principal Industrial Centers

*Write Today*

**DETROIT GRAPHITE COMPANY,**
**542 Twelfth St., Detroit, U. S. A.**

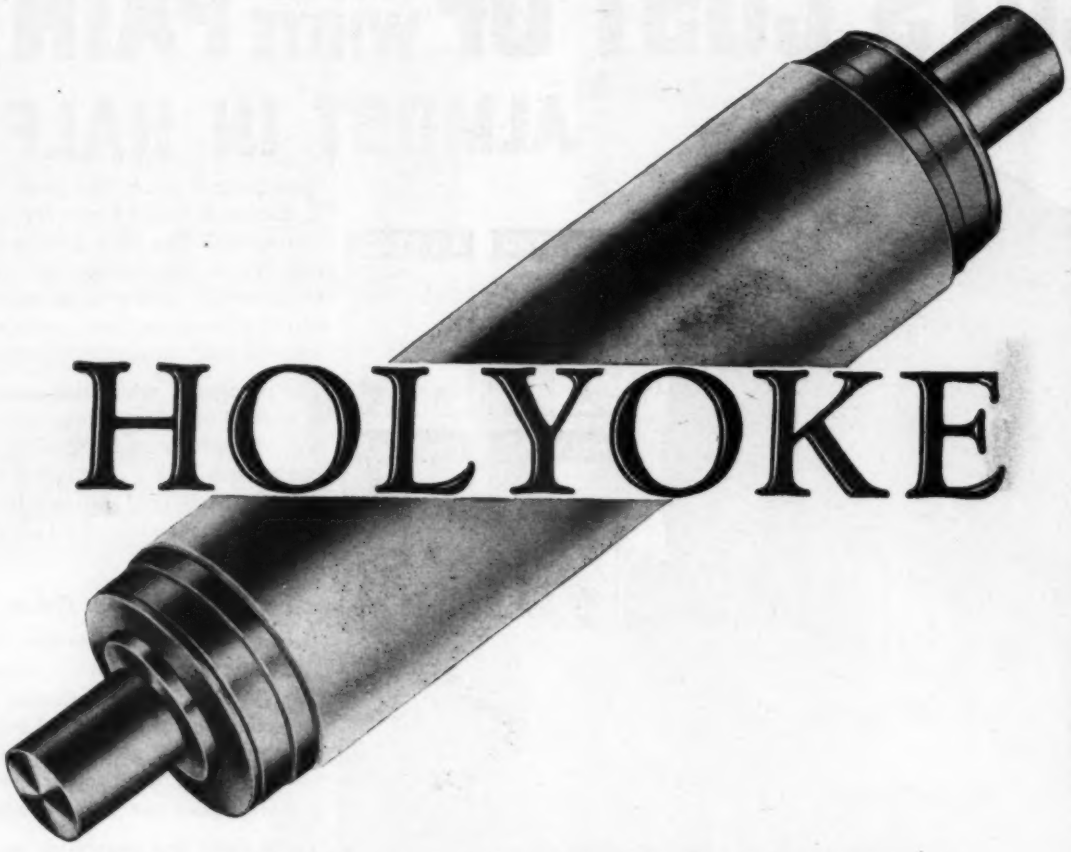
Please send me free, one copy of your new "Easy-Way Paint Chart" that gives a solution for various paint problems.

☐ Check here if you want additional information about "Sta-White".

Name_____

Address_____

# LEADERSHIP



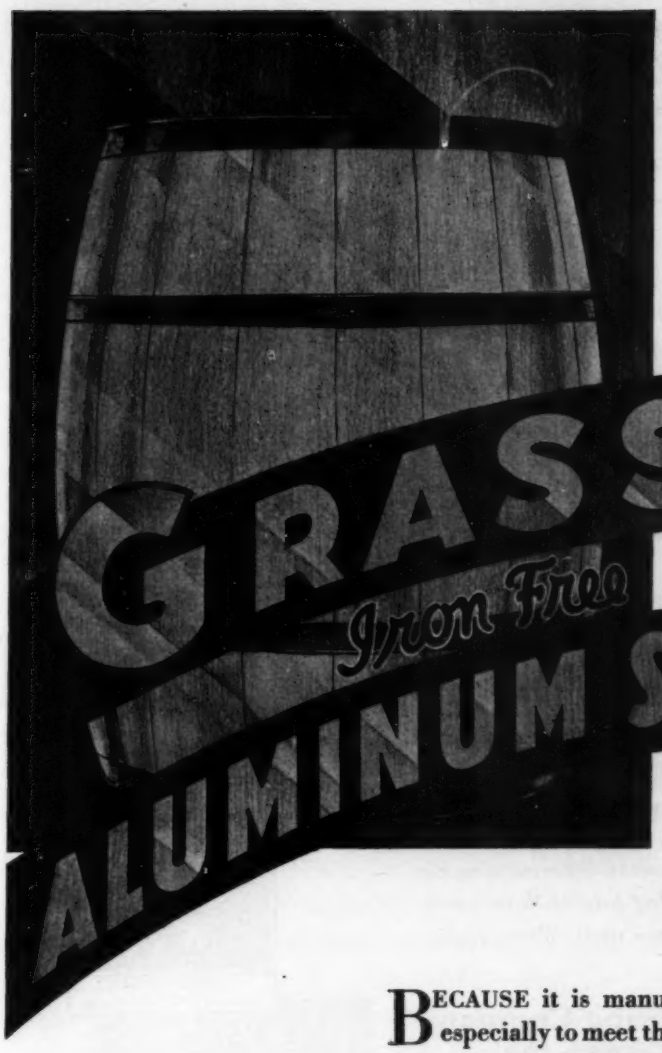
# HOLYOKE

**The longer life of the cotton and paper rolls built by the HOLYOKE MACHINE COMPANY is the natural result of seventy years manufacturing experience and knowledge of paper mill requirements. The outstanding HOLYOKE-Roll qualities of Resiliency, Uniformity, Long Life and Heat Resistance are all insured by rigid insistence upon the finer points of engineering construction.**

Write HOLYOKE MACHINE COMPANY, HOLYOKE, MASS., Manufacturers of Super Calenders, Platers, Cotton, and Paper Rolls, Washing and Beating Engines, Wood Pulp Grinders, Barkers, Chippers, Rag and Paper Dusters, Rag Cutters, Hydraulic Pumps and Presses, Hercules Water Wheels, Governors and special machinery to order.

## The HOLYOKE MACHINE COMPANY

FOUNDED 1863



# GRASSELLI
## Iron Free
# ALUMINUM SULPHATE

*For Paper Mills where* **QUALITY** *is the Watchword*

BECAUSE it is manufactured especially to meet the critical requirements of the producer of high grade papers, and because it is always uniform in its chemical and physical properties, GRASSELLI Iron Free Aluminum Sulphate will win your unqualified approval. Furnished in Lump and Granular. Shipped in barrels containing approximately 400 pounds and in bags containing 200 pounds.

Our research Department may be of help in solving some of your problems. This service is available to you. Write, wire or phone any of our branches below.

**Other Grasselli Chemicals for Paper Manufacturers:**

- Acetate of Lead
- Aluminum Sulphate, Commercial
- Aqua Ammonia
- Barium Carbonate
- Barium Chloride
- Barium Sulphate (Blanc Fixe)
- Bleach
- Caustic Soda
- C. P. Ammonium Hydroxide
- C. P. Hydrochloric Acid
- C. P. Sulphuric Acid
- C. P. Nitric Acid
- Muriatic Acid
- Salt Cake
- Silicate of Soda
- Soda Ash
- Sulphuric Acid
- Tri-Sodium Phosphate

**THE GRASSELLI CHEMICAL COMPANY**
**Founded 1839** INCORPORATED **Cleveland, Ohio**

New York and Export Office: 350 Fifth Avenue

ALBANY BIRMINGHAM BOSTON CHARLOTTE CHICAGO CINCINNATI DETROIT
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SAN FRANCISCO, 584 Mission Street LOS ANGELES, 2260 East 15th Street

Represented in Canada by CANADIAN INDUSTRIES, LTD.
Acids and General Chemicals Division—Montreal and Toronto

**GRASSELLI GRADE**
*A Standard Held High for 95 Years*

# Business is Improving

## There is a New Spirit...

. . . altering the business outlook for the better. There is a new spirit prevalent among consumers and producers. Characteristic of this spirit is the present move toward rehabilitation of plant equipment.

Let Jeffrey enter into your modernization program. We can furnish equipment with all the economies of present-day operation . . . equipment with the best cost-cutting possibilities. After all, the right kind of equipment will not only modernize your plant but after paying for itself, will add to your profits.

The Jeffrey line of Material Handling Equipment is diversified . . . there is a unit to meet any handling problem in the pulp and paper industry. A few of the many Jeffrey Products are illustrated here.

*We will be glad to send you complete information on the proper equipment for handling any bulk or package material inside or outside your mill. Write today.*

COAL
Bucket Elevator

PULPWOOD
Chain Conveyor

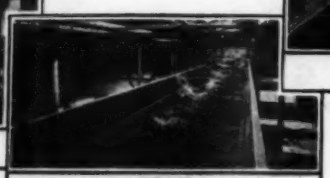
CHIPS
Scraper Conveyor

LIME & SULPHUR
Scraper & V-Bucket Conveyors

PULP LAPS
Belt Conveyor

RAGS
Wood Apron Conveyor

PAPER ROLLS
Tray Elevator



STRAW
Chain Conveyor

### The Jeffrey Manufacturing Company

944-99 North Fourth Street, Columbus, Ohio

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| New York | Philadelphia | Cincinnati | Milwaukee | Salt Lake City |
| Buffalo | Pittsburgh | Detroit | St. Louis | Birmingham |
| Rochester, N. Y. | Boston | Chicago | Denver | Dallas |
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JEFFREY MANUFACTURING COMPANY, LTD., OF CANADA
Head Office and Works, Montreal
Branch Offices: Toronto-Calgary-Vancouver

Jeffrey Equipment for handling Coal . . . Pulpwood . . . Chips . . . Lime, Sulphur . . . Pulp Laps . . . Straw . . . Rags . . . Paper Rolls . . . Packages of paper or board . . . other materials:

Chains, Steel, Malleable or Supermal
Attachments — Sprockets—Gears
Conveyors (Apron, Belt, Cable, Chain, Scraper, Pivoted Bucket, Trolley, Spiral, etc.)
Elevators
Vibrating Conveyors and Feeders
Vibrating Screens, Coolers and Dryers
Coal & Ashes Handling Machinery
Portable Loaders — Skip Hoists
Crushers—Pulverizers — Ventilation Fans
Stackers — Locomotives

# JEFFREY
## MATERIAL HANDLING EQUIPMENT

# To Assure Durability for decorative coated papers

As a coating for decorative papers, lacquer provides not only all the valuable properties of other coatings, but numerous additional advantages as well. ■ Lacquer dries rapidly, and dries hard. Yet it is not brittle—lacquer-coated papers can be bent around sharp corners without cracking, and without abrasion of the coating. ■ Because lacquer is print-proof and stain-proof, and because heat and cold do not affect it, lacquer-coated papers offer much greater resistance to handling and hard usage. ■ And because lacquer is unaffected by water, acids and alkalis, lacquer-coated papers are washable; even frequent cleaning cannot affect their brilliant beauty. ■ In many fields, lacquer-coated papers open new and profitable opportunities.

**NOTE THESE 12 POINTS OF SUPERIORITY**

1. Lacquer dries rapidly—in minutes, not hours.
2. Lacquer dries hard—and remains so.
3. Lacquer is print-proof.
4. Lacquer is stable in the drum or can; no seeds; no granules; no "skinning."
5. Lacquer produces a clean surface, free from nibs, grit, and dirt.
6. Lacquer does not water-spot—it is washable.
7. Lacquer cleans more easily—it is alkali as well as acid-proof.
8. Lacquer is stain-proof.
9. Lacquer will not wrinkle—all coats unite into one uniform film.
10. Lacquer "touches-up" perfectly.
11. Lacquers can be "tailor-made" to fit many special uses.
12. Lacquer is longer-lived and retains its beauty.

**COMMERCIAL SOLVENTS CORPORATION**

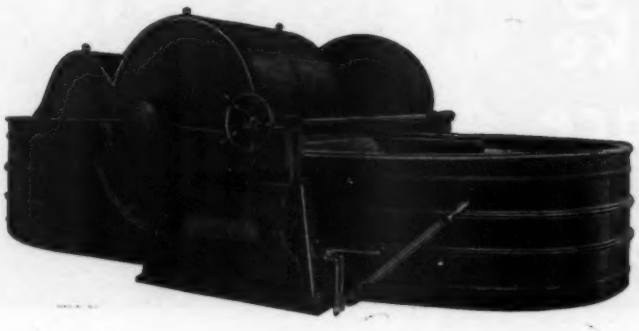
230 PARK AVENUE · NEW YORK, N. Y.

Plants at TERRE HAUTE, INDIANA and PEORIA, ILLINOIS

While Commercial Solvents Corporation does not manufacture lacquer, it supplies the coatings industry with important materials—Butanol and Butyl Acetate C. S. C.—which are determining factors in lacquer quality.

## BUTANOL *Assures* LACQUER QUALITY

# *The New* JONES MULTIBEATER Attains NEW PEAKS OF PERFORMANCE . . . . .



## *Effecting Sweeping Savings!*

Revolutionary business changes have created new situations challenging your ability to reduce costs, eliminate inefficiency, and waste.

The vital spot in your mill, where you so often have endeavored to effect important economies, has been your beater room. Now you can definitely reduce your beater room operating costs through the new Jones *Multibeater* which has absolutely proved its ability to do twice the work of an ordinary beater at less cost. It is the result of several years' intensive study, and only has been announced after thorough tests, and actual successful mill use with definite attainment of new peaks of performance.

In actual mill use, one 1,600 lb. Jones *Multibeater* replacing one 800 lb. regular type Hollander showed a possible increase in daily production capacity of 220%. Horsepower hours per ton of beaten stock were reduced 62%, saving this mill over $13.00 per ton in power alone. Required H.P. has been cut approximately 40%, while beating time has been reduced 37½% for double the former loading capacity, maintaining the same required stock characteristics as before. The beater control is so designed that accurate adjustments to thousandths of an inch may positively be maintained, giving flexibility so that same tackle can be used for writings or blottings. Circulation on 5 to 7% consistency rag stock ranged from 30′ to 60′ per minute, giving excellent mixing qualities.

No stirring is required as there is no stock lodgement. The beater also can be dumped in 6 minutes with no raking. Automatic beating control can be used, saving labor and giving much desired uniformity of beats as well as saving power and beating time.

You owe it to yourself to learn more about this new type beating engine. Our sales engineer in your territory has all the detailed facts as applied to your particular mill. He gladly will explain them to you upon request. We invite your inquiry.

**Jones**

**E. D. JONES & SONS COMPANY-PITTSFIELD, MASS.**

Builders of High-Grade Machinery for Paper Mills

# WEYERHAEUSER •• STANDARD

. . . . AS *uniform* AS

## OLD FAITHFUL

Old Faithful geyser, symbol of Nature's precision, has reared its silvery shaft every 59 minutes through the centuries. Weyerhaeuser Standard Pulp, equally unvarying, is always uniform in quality and unfailing reliability.

PULP DIVISION

WEYERHAEUSER TIMBER COMPANY

LONGVIEW
WASHINGTON

# RYERTEX BEARINGS
## for Paper and Pulp Mill Equipment

¶ They Are Water Lubricated ¶ Consume Less Power
¶ Help Produce Cleaner Stock ¶ Easily Replaced
¶ Will Run Submerged in Pulp Stock ¶ Last Longer
¶ Practically Unaffected by Acid Solutions

**Send us a sketch of your hardest working bearing and permit us to quote on a Ryertex liner. Ask for bulletin 42 for further information.**

***Ryerson Ryertex Bearings may be profitably used in the following equipment:***

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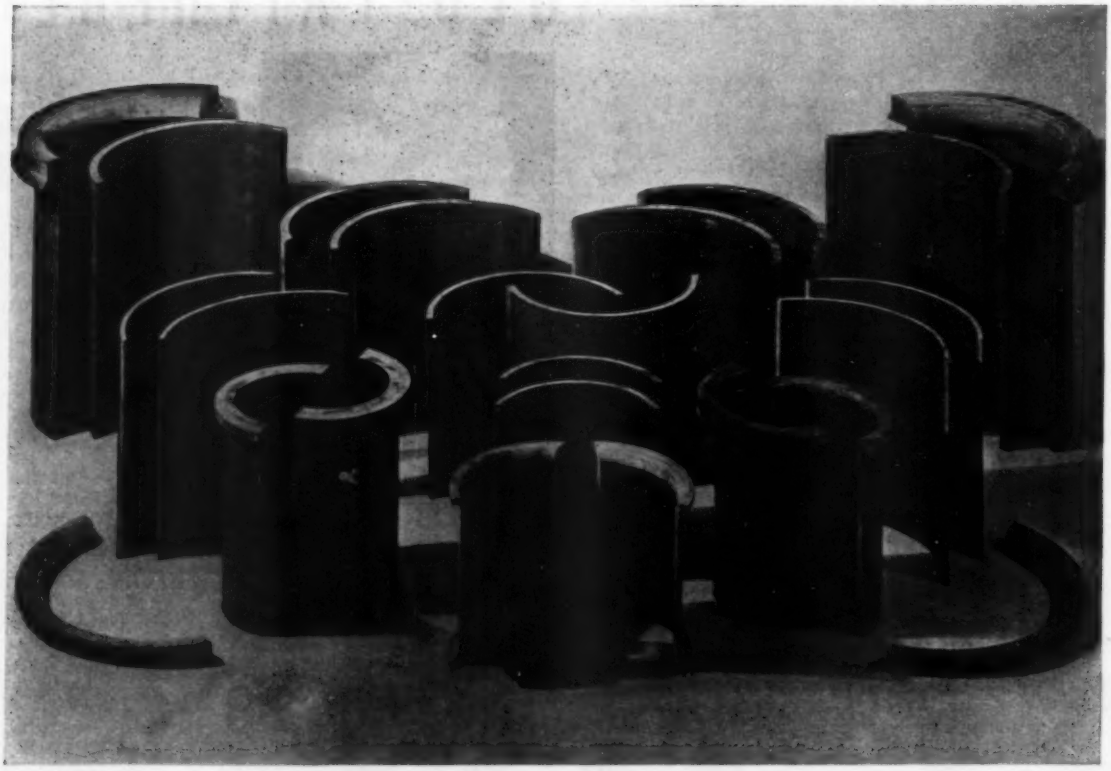
| Jordans | Log Hauls | Bark Presses | Conveyors | Screens | Deckers |
| Bleachers | Slashers | Chippers | Grinders | Beaters | Paper Machines |
| Jack-ladders | Drum Barkers | Chip Crushers | Digesters | Knotters | Refiners |

***Ryertex Non-metallic Bearings are made from a strong textile material and synthetic resins. No radical changes necessary to install them in your present equipment.***



**JOSEPH T. RYERSON & SON, Inc.** *Plants at:* **Chicago, Milwaukee, St. Louis, Cincinnati, Detroit, Cleveland, Philadelphia, Buffalo, Boston, Jersey City**

# RYERSON

THE PAPER INDUSTRY

A MONTHLY EDUCATIONAL JOURNAL

# Business Needs

## more strict adherence to

# The Golden Rule

An Interview With

**W. HARRISON UPSON, Secretary-Treasurer**

**The Upson Company**

SINCE the War, the country appears to have become financially soft and to have lost its former conception of mental balance and integrity. We seem to have become morally soft in our relations toward each other. Some of us have failed to appreciate the fact that the other fellow has rights just as much as we have and that we all have a moral obligation toward the other fellow.

As an example, let us view the intensity of the wave of chiseling which we have been through the past four or five years. We have had chiseling tactics for many years, but the depression amplified their existence. In the mad scramble to try to make both ends meet—to say nothing of trying to make a profit—some concerns, and some individuals, have ridden rough shod over everyone who came in their path.

It seemed to be the policy or motto of many that anything was all right if they could get away with it. Since so many were playing the same game, it became a case of dog eat dog in the business world, with the result that we found ourselves in a terrible predicament.

The bankers found that many men who were normally honest, and whose word had always been considered as good as their bond, would stoop to almost any kind of a trick to save their skins—and their pocketbooks—when they found themselves in a pinch.

Some merchants and manufacturers, in almost every industry, who had always been the soul of honor, were guilty of chiseling and indulging in practices which would not bear even the most casual scrutiny. But because these practices were so general, it took a good stiff jolt to bring the nation to its senses.

Many manufacturers, in their wild rush for business to keep the wheels of their plants turning, forgot that it was a violation of the fundamental law of business to attempt to sell merchandise at less than the cost of manufacture. In their eagerness to secure orders, many apparently did not give a thought as to whether they could produce the goods for the amount they had quoted. Their one aim and purpose seemed to be to beat their competitors' prices, regardless of consequences.

As a result, when orders had been obtained at ridiculous prices these foolish manufacturers found themselves in a dilemma and often resorted to nefarious practices in a vain effort to cover up their mistakes.

Quality of merchandise often was forgotten in frantic attempts to pull themselves out of the mud into which they had deliberately walked.

A year ago last summer, some of the leading magazines and some of the more prominent manufacturers began an aggressive campaign against the chiseler, and against cheap, shoddy merchandise.

The Goodyear Tire and Rubber Company, for instance, published a double-spread in the *Saturday Evening Post*, entitled, "Time to Think Something Besides Price." So closely did the text of this advertisement parallel our own ideas, that we obtained permission from Goodyear to mail copies of the advertisement to over 9,000 of the leading lumber dealers of America—people to whom we sell Upson Board and other Upson Quality Products.

With that advertisement we sent reprints from editorials which appeared in the *Ladies' Home Journal* entitled "Gypped" and from the *Delineator*, under the heading "The Cheap and the Goats."

We believe that propaganda of this kind in favor of quality merchandise sold at a fair price has been helpful in reinstating industry on its proper footing. If it had not been for the fact that some of the leaders spent their good money to call the attention of the public to the way they were being gypped by dishonest manufacturers and vendors, we would find ourselves in a much more hopeless state of affairs than we are today.

But the parasite had made inroads into our industrial

system and it will take a little longer to put our house in order.

Some think the remedy in the form of government supervision of business is worse than the disease. Undoubtedly it is for those who feel that way. But it is even worse for those concerns which are obliged to take the medicine, not because they themselves are sick, but because their neighbors were bitten by the bug.

In the pulp and paper industry, we have heard stories of shippers of raw materials accusing the manufacturers of chiseling on quality claims, weights and prices—and of the manufacturers making similar accusations against the shippers. We have heard of some dishonest shippers "loading" shipments to give them extra weight in the hope that the receiver will not detect the deception. And we have heard, too, of secret prices and rebates, which, to say the least, are unethical.

Not because we wanted to assume a "holier than thou" attitude, but perhaps because we thought further ahead than some others and wanted to continue the policy adopted over twenty years ago when the business was founded, The Upson Company during the past few difficult years has made a special effort to avoid any semblance of unethical practices which were believed to be prevalent.

For example, we have been more careful than ever before in weighing and inspecting all shipments of raw materials in order to be sure that we paid for the correct amount and quality of materials which we received. We found that only in a very few instances was it necessary to make deductions for any reason. We were just as quick to detect and correct errors in favor of the shipper, and credit back to shippers for overage in shipments.

During the past three years, we paid shippers of raw materials approximately 2 per cent more than the amount billed to us. Two per cent may not seem much, but on the purchase of several hundred thousand dollars' worth of material it amounts to quite a sum. If every manufacturer was as quick to credit back as he is to charge back, business would be smoother and more pleasant.

Operating along these lines has simply been good business for us since it has enabled us to secure better prices from our sources of supply because they know they receive fair treatment from us.

There have been, and still are, countless ideas and theories on the best way to put all business squarely on its feet again where everyone can make an honest living and receive honest value for every dollar expended.

Today the nation is one vast laboratory devoted to the performing of great industrial experiments. Some of the methods and ingredients being used are more dangerous and potent than the highest powered dynamite and must be handled just as carefully or there may be a disastrous explosion which can do untold damage.

Much of the danger can be alleviated, I believe, if all this experimentation is tempered by a goodly proportion of the Golden Rule.

# SATIN WHITE

By EDWIN SUTERMEISTER, Chief Chemist
S. D. Warren Company

ONE who searches the literature for information regarding the nature and manufacture of satin white will find only a very few papers on this subject, and if he reads these carefully he will also find that there is no general agreement as to its constitution or how it should be made. Weichelt[1] states that satin white was introduced into Germany in 1880 and was known in England considerably earlier. In view of its rather general use over a period of fifty years and considering the fact that it is made from two simple and well-known chemicals this ignorance seems rather peculiar to say the least. It is quite probably due partly to the desire of both makers and users of this project to surround their methods with a mantle of mystery and partly to the fact that the chemistry of its preparation and use is not nearly as simple as it seems, since it involves much physical chemistry which was unknown not so long ago.

To begin with, there seems to be no adequate definition of what satin white is. It is frequently described as a white pigment made by mixing calcium hydroxide and alum, but since the proportions of the two are not specified, since the kind of alum is often not mentioned and since no description is given of the physical and chemical properties of the product it hardly seems that this description constitutes a definition. As a matter of fact, it is impossible to define satin white in terms of its ultimate chemical analysis, since products containing the same percentages of CaO, $Al_2O_3$ and $SO_3$ act entirely differently when used in coating mixtures. When it comes to defining it in terms of its physical properties, difficulties are also encountered. Cobenzyl[2] describes it as a tough, pure white mass with a surface of shining specks which does not disintegrate much under water, but may be pulled apart only with difficulty and does not again coalesce. Except for the shining specks, this corresponds fairly well with many commercial satin whites, which are of such a consistency that they may be cut into pieces and handled with shovels. There are, however, others which are pressed to the same percentage of moisture but are of such a structure that jarring tends to make them flow. These can be handled with difficulty as they cannot be shoveled readily and portions which have been separated from the main mass tend to reunite with it. Apparently its description as "a white pigment made by mixing calcium hydroxide and alum" is still about the best definition that can be made to fit all satin whites.

### Manufacturing Procedure

The procedure in making satin white has varied widely at different times and probably still does in different plants, although nothing definite can be said about that. The method imported from England to this country was to mix large crystals of potash alum

with a heavy paste of slaked lime in very heavily constructed agitators. In case of emergency, ammonia alum was substituted for potash, but it was not considered to give as good a product. A somewhat later modification was to use lumps of aluminum sulphate of approximately the size of the potash alum and to employ the same mixers. Still later the aluminum sulphate was added in the finely ground state or even dissolved to a dense solution. As recently as 1929 a patent[3] was taken out for the use of sodium sulphate mixed with either the lime or the aluminum sulphate before the two are mixed for the production of the satin white. Apparently this is intended to act as a substitute for the potassium sulphate in the potash alum formerly employed. Many claims have been made as to the quality of the alum which should be used but about the only uniformity among them relates to the fact that iron should be absent or extremely low if a good color is to be maintained in the product.

As might be suspected, the different procedures employed involved the use of quite different apparatus, and as the proportions of the materials, the manner of mixing and the temperature of the reaction varied, quite different products from the standpoint of the paper coater were obtained. This is still further complicated by the fact that sometimes the original mixture is greatly diluted, screened to remove coarse matter and then filter pressed and washed, while in other cases it is made of such a density that it can be used directly without filter pressing. In this case, all the materials going into the mixture remain in the final satin white and its chemical analysis can be quite closely computed from those of the materials used.

**Formula Concepts**

As already stated, the question of what satin white is chemically has always been quite a mystery. It was formerly supposed to be a mixture of calcium sulphate and aluminum hydrate formed according to the reaction:

$3Ca(OH)_2 + Al_2(SO_4)3 = 3CaSO_4 + Al_2(OH)_6$.

This idea will be found stated in the literature at least as late as 1925[4]. Bunce,[5] in 1927 speaks of satin white as containing calcium sulphate, aluminum hydrate and calcium hydroxide, but as early as 1920 Cobenzyl gave reasons for believing that it consisted of calcium aluminate and gypsum $Ca_3Al_2O_6 + 3CaSO_4.2H_2O$. This theory of Cobenzyl's was apparently also that of Fuchs[6] who carried out investigations on the nature of the reaction and concluded that Cobenzyl's formula was correct except for the addition of small amounts of calcium hydroxide. The most recent theory is that of Meyer,[7] based on a publication of the Bureau of Standards,[8] who believes that satin white is calcium sulphoaluminate—$3CaO.Al_2O_3.3CaSO_4.31\ H_2O$.

There are many reasons for thinking that most of the early formulas are not representative of satin white. If it consists of a mixture of $CaSO_4.2H_2O$ and $Al(OH)_3$, it should show practically no alkalinity, while most satin whites contain a very considerable amount of alkaline material which may be titrated with standard acid using phenolphthalein as an indicator. This formula also calls for a loss of moisture at 100 deg. C. of only about 20 per cent of its air dry weight, while satin white actually loses about 28 per cent at that temperature. Furthermore, if the temperature were raised to 140 deg. C., experiments have shown that the mixture called for by the formula would lose a total of only 20.6 per cent of its air dry weight, while satin white loses about 31 per cent. It is very evident that this formula does not fit the facts, but if further confirmation is necessary it will be obtained by the microscope which shows the absence of gypsum crystals.

The supposition that satin white is a mixture of calcium sulphate, aluminum hydrate and calcium hydroxide is also negatived by considerations of the moisture lost on drying. Also, experiments have proved that such a mixture made from the individual materials behaves very differently from satin white in a coating mixture. Finally it does not act as a solvent for casein, which it should do if it contained as much calcium hydroxide as the titratable alkalinity calls for. It would appear that this formula is definitely out on all counts.

Considering Cobenzyl's formula as $Ca_3Al_2O_6.6H_2O + 3CaSO_4.2H_2O$, the total moisture which might be lost on drying at 140 deg. C., or even on ignition, would be 24.1 per cent while air dry satin white loses about 31 per cent at 140 deg. and 45.1 per cent on igniting. It seems quite certain that Cobenzyl's formula is also incorrect and again the absence of gypsum crystals confirms it. This formula is, however, the first one which could explain the fact that on dialysis a large proportion of the alumina passes through parchment paper.

**Drying Characteristics**

Many of these criticisms are based on the moisture content of air dried satin white so it is felt that a few words should be said in regard to the drying of satin white. This is a progressive change and the loss increases up to a temperature of 140 deg. C. at least and on ignition over a Meker burner there is a still further loss in weight. There is some question whether this loss on ignition is all moisture or whether some $SO_3$ is also driven off. It is known that part of the $SO_3$ is driven off from $CaSO_4$ at this temperature, but until experiments are conducted on the pure material composing the major portion of satin white, it will not be known whether it suffers a similar loss. The loss in weight of four different samples of satin white at different temperatures is given in the following table. All are based on the material dried to constant weight in the open air at 25 deg. C.

| Sample No. | Per cent loss in weight at 50° | 100° | 125° | 145° | Ignition |
|---|---|---|---|---|---|
| 1 | 1.16 | 25.25 | 27.80 | 28.87 | 39.98 |
| 2 | 1.15 | 28.05 | 30.42 | 31.67 | 43.13 |
| 3 | 1.45 | 30.70 | 33.05 | 34.23 | 47.48 |
| 4 | 1.08 | 27.51 | 29.35 | 30.84 | 50.88 |
| Average | 1.21 | 27.88 | 30.16 | 31.40 | 45.37 |

As compared with these figures, if the water of crystalization only is driven off by the ignition of calcium sulphoaluminate $3CaO.Al_2O_3.3CaSO_4.31\ H_2O$ the loss in weight would amount to 45.6 per cent of its weight. There must surely be some significance in the close agreement of this figure with the average loss on ignition of the four samples tabulated and it would seem to indicate that no loss of $SO_3$ occurs on ignition.

**Methods for Determining Alkalinity**

In criticizing the early formulas, it has been mentioned that they do not allow for any alkalinity in the product, although it is actually very strongly alkaline to phenolphthalein. There are several ways to look at this question of alkalinity and numerous methods have been proposed for determining it. Some consider the alkalinity as the entire amount directly titratable by acid, while others divide it into alkalinity due to the satin white proper and that due to free lime which has not combined with the alum. Dreshfield[9] has proposed a method for the determination of excess lime which depends on treating the satin white with sugar solution, filtering and washing under definitely controlled conditions, and titrating the alkaline filtrate and washings. If this treatment is repeated several times on the same sample, alkali will be removed each time, indicating that the results do not depend on the total removal of a small and definite amount of calcium hydroxide but rather on the solubility of the satin white itself in sugar solution of the strength used. The presence of alumina in the solution after titration affords further evidence that the substance being titrated is not calcium hydroxide but an alkaline substance containing alumina which is set free when the basic portion of the compound is neutralized by the acid.

Another method which is used for determining the alkalinity of satin white is direct titration with standard acid using phenolphthalein as the indicator. This method will give the total alkalinity of the product and will include that of the satin white molecule itself as well as any actually present as calcium hydroxide. This method can be used to determine the uncombined calcium hydroxide only if a complete analysis of the sample is made and if it is assumed that satin white is some definite compound. It is, however, a useful control test in making satin white, although it is interesting to note that among commercial samples tested the one which gave the highest alkalinity by titration was claimed by its makers to have the least free lime. So far it has not proved possible to reconcile these two statements.

If this direct titration method is used it is found that commercial satin whites show alkalinities of around 17.7 to 18.5 per cent expressed as $Ca(OH)_2$ and based on the air dry satin white. The alkalinity of the calcium sulphoaluminate molecule would be 17.8 per cent on the same basis. Here is another bit of evidence indicating that satin white is essentially calcium sulphoaluminate.

If this is true, it would be expected that carbon dioxide would break down the molecule by combining with the CaO and setting free the $Al_2O_3$ in the hydrated form and the calcium sulphate as gypsum. This is found to be the case, for if $CO_2$ is passed into a suspension of satin white in water gypsum crystals can be readily detected under the microscope, together with structureless material which is probably aluminum hydrate. The original crystalline form is completely changed and calcium carbonate can be detected by evolution of $CO_2$ by treating with acid. This reaction with carbon dioxide should set free a large proportion of the water of crystallization of the calcium sulphoaluminate according to the equation $3CaO.Al_2O_3.3CaSO_4.31\ H_2O + 3CO_3 = 3CaCO_3 + 2Al(OH)_3 + 3CaSO_4.2H_2O + 22\ H_2O$.

According to this, the loss due to carbonation and air drying should be 21.2 per cent of the original air dry weight and from two tests on different satin whites the figures found were 19.4 and 25.4 per cent respectively. Considering the differences in the two products used and the impossibility of air drying satin white without the absorption of some $CO_2$ these are considered as reasonable checks with the theoretical and as strengthening the evidence that the reaction takes place as given above.

Meyer finds that a similar reaction takes place when satin white is treated with soda ash:
$3CaO.Al_2O_3.3CaSO_4.31\ H_2O + 3Na_2CO_3 = 3CaCO_3 + 6NaOH + Al_2O_3 + 3CaSO_4.2H_2O + 22\ H_2O$.
This reaction may have some bearing on the action of coating mixtures where soda ash is used as a solvent for casein which is to be used in the presence of satin white.

Mention has been made of the presence of alumina in the solution obtained by dialysis of satin white. One such test showed the presence of 86.2 per cent of the $Al_2O_3$ and 87.6 per cent of the CaO present in the sample taken for the test. This dialysis was admittedly somewhat crude as it was impossible to prevent completely the action of $CO_2$ on the sample and there may have been some slight action on the glass vessels due to the very long time necessary to reach a point of neutrality to phenolphthalein. Even under such conditions the results are considered to have an important bearing on the constitution of satin white as they could not have been obtained if the aluminum had been present as $Al(OH)_3$.

In the present state of our knowledge and considering all the evidence here presented, it seems most likely that satin white is calcium sulphoaluminate with the formula $3CaO.Al_2O_3.3CaSO_4.31\ H_2O$.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2. A. Cobenzyl, *Chemiker Zeitung*, Sept. 7, 1920, p. 661.
3. Brit. 327,848, March 28, 1929, to Riley's Chemicals & Colors, Ltd., and C. H. Riley.
4. J. Gould Bearn, *The Chemistry of Paints, Pigments and Varnishes.*
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9. Private communication.


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## Old Manuscript Found to Contain Linen Fibers

The Bureau of Standards found on examination of specimens of papers from some old manuscripts that they were composed largely of linen fibers. As the manuscripts were said to bear dates ranging from 1000 to 1749 A. D., and to be in good condition, they are evidence of the enduring quality of this kind of fiber. The manuscripts were of Arabian and contiguous origin and this circumstance fits in well with historical evidence that the Arabs used linen largely in the early days of papermaking. Their so-called "silk" paper, a thin smooth paper that was held in great esteem, is said to have been made of linen fiber. History records that the Arabians learned papermaking from the Chinese, the originators of paper, through the capture of some Chinese papermakers.

# Roofing Felt Raw Materials and Quality Control

By A. O. BRAGG

ROOFING felt, also termed saturating felt, comprises those fibrous sheet products used as media for absorption and coating with asphalt, tar, etc., in the manufacture of roofing and allied products. It is a finished product, with characteristics dictated by its use requirements. Among those characteristics are:

Ability to absorb large amounts of hot asphalt, tar, etc.

Strength to withstand the pull on the sheet as it passes through the saturating and subsequent operations.

Weight to obtain the desired ratio of fibre to asphalt in the saturated felt.

Moisture content to permit economical speed in saturating.

Minimum of defects, such as checks, holes, lumps, excessive hardness or softness, etc., to prevent manufacturing irregularities and the production of a defective product.

The function of the felt is to serve as a carrier for the asphalt saturant, and as a base for the asphalt coating and mineral covering of slate, etc. Thus the felt weight per square foot should be as low as possible consistent with other requirements, so that the maximum "sheetage" of roofing may be obtained per ton of felt.

Since the first consideration in the manufacture of a sheet of felt is to obtain the maximum in saturation, very free stock is used. It must also be cheap. Free stock gives a sheet of open texture and allows for the formation of single-ply sheets in the required thickness. Such sheets homogeneously formed are preferable to sheets built up of two or more plies, since sheets of more than one ply are liable to split when emerging from the hot asphalt after saturating.

For this reason, most mills use one cylinder mold of large diameter, as 42-inch or 48-inch together with two presses and about sixty-five dryers for water removal. In isolated cases in this country, and generally in Germany, however, a fourdrinier machine is used.

### Raw Material Grades

The bulk of the felt tonnage is made from six grades of raw materials, all of which are wastes and by-products. These materials are defined in a classification of rag stock, adopted by the rag felt and paper manufacturers, which is given in Table I.

In addition to these grades indicated by the classification, several special wastes are utilized. Among them are carpet strings, dust, dark cottons, cotton waste, mill out throws, stockings, paper and strings.

Canvas, window shades, strings, sisal, buckram, cotton linters, cottonseed hulls, cotton sweepings and pickers, and wool waste when baled separately can also be used in the manufacture of felt, but should not be included in the classification of grades. Neither should they be shipped unless so authorized by the purchaser.

Rags and all materials purchased are guaranteed by shipper to be dry and free from rubbish or any material not suitable for making paper or felt. Class 6 containing moisture will be accepted, but is bought and settled for on basis of actual dry weight.

Included in the materials not suitable for the manufacture of felt paper are: shoe cuttings, felt boots, hats, corsets, suspenders, oil cloth, matting, leather, rubber, rope, mackintosh clippings, pasted stock, wood, stones, excelsior, metal of all kinds, tin cans, glass, bottles, ashes, bones, shoes, oily rags, etc.

The price of rags varies considerably at different seasons. Thus large rag stock-house facilities at a roofing felt plant are essential. In this way, advantage can be taken of low price purchases.

Rags in storage, however, should be inspected frequently and the piles turned over to prevent spontaneous combustion. There is also considerable danger of fire in the rag cutting operation from matches left in pockets of old coats, pants, etc. It is, therefore, advisable to thoroughly equip all sections of a mill handling dry rags with sprinklers.

All raw materials for roofing felt are characterized by their degree of hardness or softness. Hard stock reduces saturating ability of the sheet; while soft stock promotes it. The degree of uniformity, and dependability and availability of supply are also important.

A summary of pertinent facts regarding each of the several raw materials is given in Table II. Table III includes maximum and minimum tolerance data on a number of grades of finished felt, while Table IV presents data on the average composition of rag and paper furnishes for felts of different weights.

**Table I**

*Grades:*

*No. 1 Roofing Rags:*
Soft rags containing a percentage of wool.
Satinet garments, including men's coats, pants, vests, mixed linsies, seams, women's coats, sacks and cloth skirts, all containing a portion of wool fiber.

*No. 2 Roofing Rags:*
Cotton rags.
Large and small cotton rags, including linings (without seams attached), silk rags, rag carpets, print rags and stockings.

*No. 3 Gunny Bagging:*
Free from fertilizer, charcoal, coal and cement sacks, chemical, lime and plaster bags.

*No. 4 Brussels and Hard Back Carpets:*

*No. 5 Roofing Rags:*
A. Tailor rags, free from all rubbish and paper.
B. Tailor rags, to contain not more than 10 per cent paper.
C. Tailor rags, to contain 10 per cent and not over 50 per cent paper.

*No. 6 City Dump Rags:*

**Table II**

| Grade | Uniformity | Softness | Remarks |
|---|---|---|---|
| No. 1 Roofing Rags | Constant | Soft | |
| No. 2 Roofing Rags | Very variable | Soft | |
| No. 3 Gunny Bagging | Constant | Soft | |
| No. 4 Brussels and hard back carpets | Variable | Hard | |
| No. 5A | Variable | Hard | Small supply |
| No. 5B | Variable | Hard | Small supply |
| No. 5C | Variable | Hard | Small supply |
| Carpet Flyings | Constant | Soft | |
| Cotton Waste | Constant | Medium soft | Poor saturating qualities |
| Dark Cottons | Constant | Mostly hard | |
| Dust | Constant | Mostly hard | |
| Mill Out-throws | Variable | Mostly hard | |
| Stockings | Constant | Soft | Small supply |
| Paper (mixed) | Variable | Hard | Large supply |
| Strings | Fairly constant | Mostly hard | |

## Preparation of Rags

In preparing the rags for an order to be run on the machine, a Rag Formula is made out. This formula corresponds to the usual beater furnish of board and paper mills; except that the rag furnish is proportioned before the rags are delivered to the beaters.

Knowing the rag formula, the rag bales are weighed, opened, and sorted. Sorting must be carefully done to remove any concealed metal from the material. Mechanics' overalls, for example, frequently contain reamers, files, etc., in the pockets and if not removed would play havoc with the cutter knives, the cutting operation following immediately after the mixing of the rags in the desired amounts.

The cutter must be of rugged construction and able to handle large quantities of rags in short time intervals. It must also be able to cut the rags into pieces about one inch square since the size of the cut rags controls the possible output of the beaters.

The rags, after cutting, are conveyed by trucks, belt conveyors or a blower system to the rag beaters, while the required paper stock is beaten separately.

The use of small capacity beaters for the treatment of the rags is desirable. The smaller weight of the rolls in such beaters does not tend to unduly hydrate the rags, but maintains their maximum freeness. For the same reason, continuous rag beaters are advantageous, because the rags are released from them to a stock chest as soon as they are broken up and de-fibered sufficiently.

One felt mill to indicate the beater requirements of a plant producing from 70 to 76 tons of felt per day on three machines, uses the following beater equipment: eleven 1,000 lb. rag beaters; nine 750 lb. rag beaters; two paper stock beaters (continuous).

In this same mill, the mixed papers are weighed and furnished to the two 1,000 lb. paper stock beaters. These beaters dump into a chest from which the stock is pumped to a regulating box supplying the jordan. The rag stock, regulated by a separate box, supplies the same jordan.

This system is not wholly satisfactory. It is necessary to run felt to the desired degree of saturation; i. e., hardness or softness, for the particular weight being made. In this case, variation in the hardness of the sheet, even in running one weight, is great. This variation results from adjustments by the machine tender. When the sheet is running too soft, for example, the paper stock gate is opened a little to permit a gain in hardness. The time lag resulting from the transfer of stock in the chest to the finished felt causes the valve to be opened too far before results from the adjustment appear at the winder. Such an adjustment throws the sheet on the hard side, making it necessary to reverse the process; namely, to increase the rag content and to decrease the paper stock proportions. Moreover, it is often impossible to tell whether hardness at any particular time is due to an excess of hard rags or to too much paper. Yet this knowledge is vital to intelligent felt machine operation. To avoid similar conditions, some mills are installing measuring tanks from which accurately known amounts of paper pulp can be mixed with the rag stock.

While furnishes differ among the mills, heavier weight felts require softer stock than the lighter weights. The latter, being thinner, saturate more quickly—a characteristic which makes it possible to use paper stock and the harder rags in their manufacture. The same stock, if used in heavier weights, would produce felts with too slow saturation qualities.

The percentage of moisture in the felt also affects the degree of saturation. Absorption of saturant does not commence until all moisture has been vaporized as steam from the felt while passing through the hot asphalt bath. At a constant felt speed through the bath, the less the moisture, the greater the actual time during which asphalt enters the sheet and the less the time spent in evaporating water. Table V shows the saturating qualities required of felt.

**Table III**
Maximum and Minimum Tolerances for Various Grades of Felt

| Grade | Weight per 480 sq. ft. | Caliper | Mullen (Burst) Test | Moisture |
|---|---|---|---|---|
| 25 | 23-27 | .025 | 15-20 | |
| 31 | 29-33 | .031 | 18-23 | |
| 35 | 33-37 | .035 | 20-25 | |
| 50 | 48-52 | .050 | 25-30 | 00% Optimum. Not over 3% |
| 60 | 58-62 | .062 | 30-35 | |
| 70 | 67-73 | .073 | 35-40 | |
| 75 | 72-78 | .078 | 37-42 | |
| 80 | 77-83 | .084 | 40-45 | |

**Table IV**

Average Composition of Rag and Paper Furnish for Roofing Felts of Various Weights

| Grade of Rags | Lbs. and No. of Bales | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 25# | 35# | 40# | 45# | 47# | 50# | 55# | 60# | 65# | 70# | 75# |
| No. 1 | | | | | | | | | | | 1200# 2 |
| No. 2 | 900# 1½ | | 900# 1½ | | | 1200# 2 | | 1500# 2½ | 1800# 3 | 1500# 2½ | 1500# 2½ |
| No. 3 | | Strings 19.6% | | | | 300# ½ | | 300# ½ | | 300# ½ | |
| No. 4 | | | | | | | | 150# ¼ | 300# ½ | 300# ½ | 600# 1 |
| No. 5A | | | | | | | | | | | |
| No. 5B | | | | | | | | | | | |
| No. 5C | 600# 1 | 12.8% 400# (1) | 600# 1 | | | | | | | | |
| Carpet Flyings | | | | | | | | | | | |
| Cotton Waste | | | | | | 50# | | 50# | 50# | 50# | 50# |
| Dark Cottons | 600# 1 | 36.3% 1135# | 600# 1 | | | 600# 1 | | Mill Screenings 600# | | Mill Screenings 600# | |
| Mixed Rags | | Mixed Rags 12.8% 400# | | | | | | | Mixed Rags 1 | | |
| Mill Outthrows | | | | | | | | | | | |
| Stockings | | | | | | | | | | | |
| Mixed Paper | 100# | 14.8% 464# | 50# | | | | | | | | |
| Strings | 300# ½ | Mixed Rags 12.8% 400# | 300# ½ | | | | | | | | |
| Scrap Felt | | 3.7% 400# | | | | | | | | | |

(Fractions refer to fractions of a bale)

**Control of Manufacturing Operations**

Tests to control the quality of felt include the determination of moisture, weight, bursting strength, caliper, and asphalt absorbency.

The routine for moisture testing follows closely that in use in paperboard mills. Best practice includes a test for moisture at the time of manufacture, and a second test just before saturating. In both cases, the ideal sample consists of a strip the full width of the roll, or of the machine trim. If such a sample cannot be obtained, then fairly representative samples one foot square can be cut from the front, center, and back of the sheet. About one roll out of every three in a carload, or an equivalent weight should be sampled for testing before saturating. In obtaining these samples, three or four of the outer layers are cut away, and then the sample cut from the exposed sheet. This procedure reduces the tendency for error that would result from the sampling of the outside layers with their higher moisture content.

At the same time, similar samples 12 in. x 12 in. should be weighed on the usual papermaker's scale and the weight expressed in pounds per 480 square feet or square. The bursting strength of the felt is determined in the ordinary manner with a Mullen tester, while its thickness or caliper is measured with a standard micrometer. The caliper of the sheet not only provides a check on thickness uniformity across the width of the sheet, but, when correlated with the weight, indicates the condition of press rolls and felts.

Two methods are in use for determining asphalt absorbency of the felt: The first method is usually employed in routine work; while the second is for more accurate determinations.

To make a test by the first method, it is necessary to secure a good sized piece of felt from which two pieces, each 12 inches square, can be cut. The weight and caliper of each of the two squares are then determined. One piece of felt, exactly 4 in. x 8 in., is next cut from each square and its weight determined on a balance to the nearest milligram.

In the meantime, not less than one quart of asphalt saturant, on which the penetration and melting point has been determined, is heated slowly in a shallow pan to 350 deg. Fahr. This temperature, maintained for a few minutes while the saturant is being thoroughly

**Table V**

| Grade of Felt | Weight | | Caliper | | Mullen, above: | Time of Immersion (Seconds) | Penetration of Asphalt | Temperature of Saturant | Percentage of Saturation |
|---|---|---|---|---|---|---|---|---|---|
| | Max. | Min. | Min. | Max. | | | | | |
| 25 | 27 | 22 | 022 | 028 | 21 | 30 | 60 | 350 Fahr. | 150 |
| 31 | 33 | 29 | 028 | 034 | 23 | 36 | 60 | " " | " |
| 35 | 37 | 33 | 032 | 038 | 24 | 40 | 60 | " " | " |
| 50 | 52 | 48 | 049 | 053 | 29 | 52 | 40 | " " | " |
| 60 | 62 | 58 | 057 | 063 | 32 | 55 | 60 | " " | " |
| 65 | 67 | 63 | 062 | 068 | 34 | 59 | 60 | " " | " |
| 70 | 72 | 68 | 067 | 073 | 36 | 62 | 60 | " " | " |
| 75 | 77 | 73 | 072 | 078 | 37 | 64 | 40 | " " | " |

mixed with a glass stirring rod, must not vary more than three degrees when at least 6 inches of one of the 4-in. x 8-in. pieces of felt is completely immersed in the saturant. The length of immersion in number of seconds is specified in Table V for any particular weight of felt.

Following the immersion, the felt is taken from the bath, all surplus saturant removed from it at once by means of a spatula; and then allowed to cool to room temperature. After cooling, the piece is cut into exactly two 4-inch squares; and the square that was completely immersed is weighed on a balance to the nearest milligram. The percentage of saturation is then calculated through the use of the following formula:

$$\frac{\text{Wgt. of 4" sq., saturated} - \text{Wgt. of 4" sq. dry}}{\frac{\text{Wgt. of 4" x 8" piece} - \text{wgt. of water}}{2}} = \% \text{ saturation}$$

The second 4-in. x 8-in. piece is treated exactly as the first and an average of the two results recorded.

The same general instructions as have been outlined are followed in making the test by the second method. The weight of the felt and caliper are determined in the same way. The two 4-in. x 8-in. pieces, however, are not weighed before being immersed, but are immersed and one piece about 3 inches square cut from near the center of each of the completely immersed ends. These 3 inch squares, after being allowed to cool to room temperature, are weighed to the nearest milligram; and then completely desaturated with carbon bisulphide or chloroform.

The desaturated pieces are placed in an oven and allowed to remain for exactly thirty minutes at 175 deg. Fahr. Upon removal from the oven, they are immediately weighed and the percentage of saturation calculated as follows:

$$\frac{\text{Wgt. of 3" sq. saturated} - \text{Wgt. of 3" sq. desaturated}}{\text{Wgt. of 3" sq., desaturated}} = \% \text{ saturation}$$

Certain other tests, such as ash determination, tensile strength, and fiber analysis, are also valuable indicators of quality. The ash determination is best carried out in a muffle furnace; tensile strength may be conveniently determined with a tensile strength machine; while fiber analysis may be made by the usual microscope estimation methods. In making a fiber analysis, it is well, because of the great varieties of fibers present, to examine the same sample with several different stains, such as Herzberg and Sutermeister. Then the results should be compared in making a final estimate. It is also essential to have standards representing average composition of the various raw stocks used in the settings for comparison.

### Felt Defects

It should be pointed out that the higher the allowable moisture content in the making of paper and board, the more is the profit for the mill, while for saturating felt the reverse holds true. The ideal felt, although it is seldom realized, would contain 0.0 per cent moisture. Table VI, however, indicates the usual

**Table VI**

| Car No. | Felt Mill Tests Per cent Moisture | | | Saturating Plant Tests Per cent Moisture | | | Differences | Days Elapsed |
|---|---|---|---|---|---|---|---|---|
| | Min. | Max. | Aver. | Min. | Max. | Aver. | | |
| 1 | 3.6 | 4.0 | 3.7 | 4.8 | 9.2 | 6.7 | plus 3.0 | 24 |
| 2 | 3.3 | 4.4 | 3.7 | 5.8 | 10.0 | 8.3 | " 4.6 | 23 |
| 3 | 3.5 | 4.0 | 3.7 | 5.4 | 14.0 | 7.8 | " 4.1 | 21 |
| 4 | 3.1 | 4.2 | 3.4 | 2.4 | 9.0 | 5.1 | " 1.7 | 21 |
| 5 | 4.1 | 4.5 | 4.3 | 2.8 | 7.7 | 4.8 | " 0.5 | 18 |
| 6 | 3.2 | 4.5 | 3.8 | 5.6 | 7.8 | 6.5 | " 2.7 | 19 |
| | Average | | 3.43 | | | 6.53 | plus 2.76 | 21 |

range of moisture content of felt as shipped from the mill and its gain in mositure content through storage. The data in this tabulation were based on tests made on finished rolls that were shipped about 200 miles in freight cars and then held for several days at the roofing plant before saturating, the moisture tests being made on the felt as shipped and just before saturating.

It should be stated that the moisture content of felt should not exceed 3 per cent at the saturator, since all of the moisture must be driven from the felt before saturation commences. The speed of the saturator, therefore, must be set according to the moisture content of the felt at the time. The correlation between weight, caliper, moisture and per cent saturation is shown in Table VII, a tabulation based on tests made on a carload of 35-pound felt.

The whole matter of moisture control is partly a matter of correct felt machine equipment and operation, and partly a matter of proper protection in transit, if shipped, and the saturation of rolls as quickly as possible after making. Too much slacking up of press rolls, incorrect crown on press rolls, dirty felts, and too high machine speed for steam available for drying are frequent causes of a high moisture content in felt.

With poor weight regulation a 50-pound felt has been known to vary from a low of 39 lb. to a high of 64 lb.

If the felt is too heavy, the amount of coating asphalt must be decreased, thus resulting in lower fire resisting and wearing qualities in the finished shingles. If the felt is too light, the coating asphalt must be increased to bring the weight of the roofing to a certain finished weight per 480 sq. ft. If the roofing or shingles are made too thick, through the application of extra asphalt, many cracks develop in the asphalted product. These cracks, causing a short life in the roofing, are due to the high coefficient of expansion of the material.

With proper equipment and care in felt machine operations, felt weight can be controlled to within 3 lb. over or under.

Checks constitute one of the most prolific causes of finishing plant troubles. The felt, under tension in its passage through the saturator, has a much smaller tensile strength immediately after emerging from the saturant than before being saturated. A checked felt opens up at this point like fish scales; splits to half or less of its original thickness; and breaks.

Too sudden an increase in pressure gradation between press rolls usually combined with slow stock which retards expulsion of water from the sheet is the primary cause of checking. Therefore, the elimination of checks is up to the felt mill and is accomplished through the installation of more or better suction boxes ahead of the presses, slower machine speed, cleaner felts, and in short, through the use of any measure which will reduce the water content of the sheet before it reaches the presses.

Felt, which is too soft, is often too weak and this causes breaks and production losses. On the other hand, a felt that is too hard is usually too strong and saturates with difficulty.

Breaks, occurring during the saturating process, are sometimes caused by poor formation on the cylinder of the felt machine. Another cause is that of carrying too much draw between the presses, or between the last press and dryers, or between the dryers. This draw may not be great enough to cause a machine break, but if the sheet is not run slack enough, especially between the presses, the fibrous formation will be distorted and the sheet weakened.

Although the hardness of a felt may be determined crudely by feel, a rather close indication of the saturating properties of a sheet can be obtained from a study of bursting strength figures. To cite an example: a 50-pound felt testing 25 lb. in bursting strength would be considered hard enough, while twenty pounds would be considered too soft.

As is usual in cylinder machine products, the tensile strength of felt in the machine direction is about twice that across the grain. Logically, there is no good reason why tensile strength determinations should not be as accurate an indicator for hardness as bursting strength determinations, and a better measure of performance in saturating as well. A correlated study of furnish, saturation qualities and tensile strength with the object of increasing uniformity and reducing saturating plant delays no doubt would result in valuable results.

**Table VII**

| Weight | Caliper | Moisture | Per Cent Saturation |
|---|---|---|---|
| 32.6 | 029 | 3.0 | 143.8 |
| 41.1 | 036 | 3.7 | 160.3 |
| 33.7 | 036 | 5.6 | 120.6 |
| 33.2 | 036 | 7.9 | 109.3 |
| 35.8 | 033 | 5.3 | 157.5 |
| 34.9 | 026 | 2.6 | 98.2 |
| 37.5 | 034 | 5.6 | 108.2 |
| 34.6 | 032 | 6.1 | 164.0 |
| 36.5 | 032 | 5.8 | 122.0 |
| 34.0 | 031 | 5.4 | 131.7 |
| 36.3 | 035 | 4.3 | 138.3 |
| 35.9 | 033 | 5.2 | 168.6 |
| 38.6 | 023 | 3.2 | 99.3 |
| 36.0 | 032 | 5.7 | 113.5 |
| 37.0 | 033 | 3.2 | 111.3 |

Another defect, the remedy of which must be sought in the mill, is that of holes in the felt caused by the dislocation of lumps of wood, glass, metal and other hard materials while passing between the squeeze rolls of the saturator. Ample rifflers, provided with baffles and burlap bagging on the bottom, should be installed between the machine regulating box and the screens to remove a large part of the foreign material. The screens, equipped with rather fine slotted plates, should have sufficient capacity as should the jordans. In addition, jordan fillings should be kept in first-class condition at all times. The use of continuous beating systems provided with rifflers and deckers has also proved of great value in obtaining cleaner stock.

# Two Chippers in Place of One

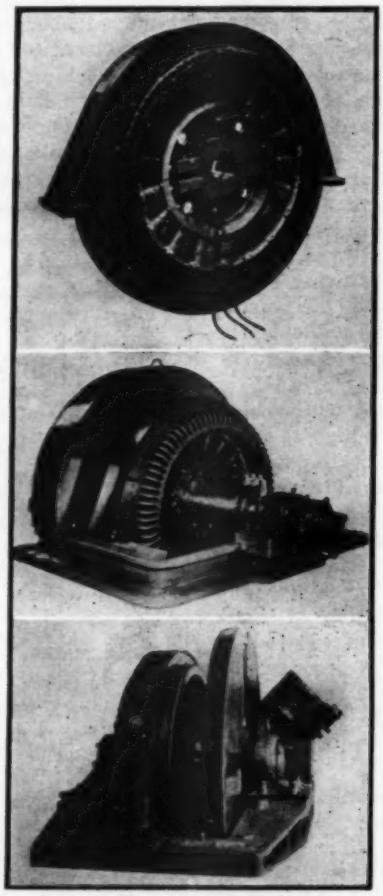
By F. M. ROBERTS,
Industrial Engineering Department,
General Electric Company

MODERN engineering economists appreciate the value of floor space and the cost of a roof. One of the most up-to-date power plants has no roof at all over the machinery which is itself weatherproof rather than to construct a roof over the entire plant. Suppose it is necessary for a mill operator to increase the capacity of his wood room. He may need to add chipper capacity, or to add screens or conveyors. His problem is to decide where to put the additional equipment. He may build an extension to the building, but that requires additional ground space, walls and a roof, or he may so rearrange his existing equipment to use the buildings he has and by economizing in the space required by each machine increase the capacity of the plant without extending the buildings.

A redesign of the chipper drive presents one of the best prospects for space economy, because these machines are usually driven by induction motors through flat belt drives. Such a drive takes up a great deal of valuable floor space. For example, an 88-inch diameter chipper occupies a floor space of approximately 80 sq. ft., including the base and the driving pulley. A suitable 150-h.p. slip ring induction motor with its belt drive will occupy a floor space of approximately 100 sq. ft. In other words, 25 per cent more floor space is required for a chipper drive of the old type than is required for the chipper itself. Obviously, if the slip ring induction motor and the belt drive were to be eliminated, it would be possible to install two 88-inch diameter chippers in the space previously occupied by one chipper and its drive. This can be accomplished by the use of a motor direct connected to the chipper shaft in the space previously occupied by the driving pulley.

A prominent engineer once observed that, "The solution of a problem is half completed when the problem has been expressed in words." True enough, but here was an exception that proved a rule because it was a long way from the idea of the direct connected chipper motor to the realization of the idea.

It has been previously stated that the common drive for the wood chipper is an induction motor and a belt. The reason for the popularity of this type of motor may be found by considering the characteristics of the application. The chipper rotor is exceedingly massive and it has considerable "flywheel effect." When mounted on sleeve type bearings, the starting duty is heavy and considerable work must be done to accelerate the rotor to synchronous speed. At all times while in operation, the machine is subject to tremendous mechanical vibration. Slip ring or squirrel cage induction motors have suitable starting and operating characteristics and the belt drive cushions the motors so that they are not subject to the mechanical vibrations.



Upper—Synchronous motor without end shield to show windings
Center and Lower—Two views of direct connected chipper drives showing adaptability of plate steel stator frame

First considerations of a direct connected drive for a chipper naturally included a slip ring or squirrel cage induction motor as a driving unit. These types of motors, while suitable for driving the chipper through a belt, have some characteristics which make them unsuitable for direct connection. To have a reasonably good power factor, an induction motor must have a small air gap, which is a decided hazard in a machine subject at all times to considerable mechanical vibration. Although an induction motor designed for operation at 720 r.p.m. or 900 r.p.m., such as those used for driving a chipper through a belt drive, may have reasonably good power factor and a fairly high efficiency, yet a motor of the same horsepower rating for direct connection at a lower speed will have a much poorer power factor and a lower efficiency. However, induction motors have one important characteristic which makes them desirable for this application and this has been responsible in a large measure for their popularity in the past; they are very efficient during the starting period and can readily accelerate the heavy disc with its high flywheel effect.

The tailor made motor for direct connection to a wood chipper is one which combines high operating efficiency, high power factor and constant speed with high efficiency during the accelerating period. At the same time, the motor must be of liberal mechanical design so that it will not suffer from the mechanical vibration to which it is subjected. Provision must be made to move the rotor of the chipper within the stator to adjust the cut of the knife. Such a motor is, in fact, a combination of two motors in the same frame; a synchronous motor during operation and an induction motor while starting.

At one time it was contended that the use of synchronous motors for operating chippers, which have a fluctuating load, required the introduction of a large flywheel effect into the motor rotor, to smooth out the pulsations of line current. This has been found to be erroneous since it is proven by a simple mathematical analysis that the combined flywheel effect of the chipper rotor and the rotor of the conventional type synchronous motor is more than sufficient to limit the line current pulsations to such a low value that further improvement is not justified. Thus the motor rotor may be of the conventional design.

The problem of building a motor of conventional design throughout without expensive modifications, which will permit a movement of the rotor with respect to the stator, presented a difficult problem which had a very simple solution. This solution consisted of designing a stator stacking 1½ inches longer than the rotor stacking, so that the rotor may be moved mechanically with respect to the stator, along the axis of the chipper shaft, a distance of 1½ inches and still operate in a normal manner. Such a design permits the operator to adjust the cut of the knives without disturbing the stator on the chipper base.

The modern chipper is provided with ball and roller bearings, the former to absorb the thrust and to carry part of the load and the latter to carry the major part of the load of the chipper and the motor. This type of mechanical construction makes it unnecessary to supply a motor with a very high starting torque; approximately 40 per cent

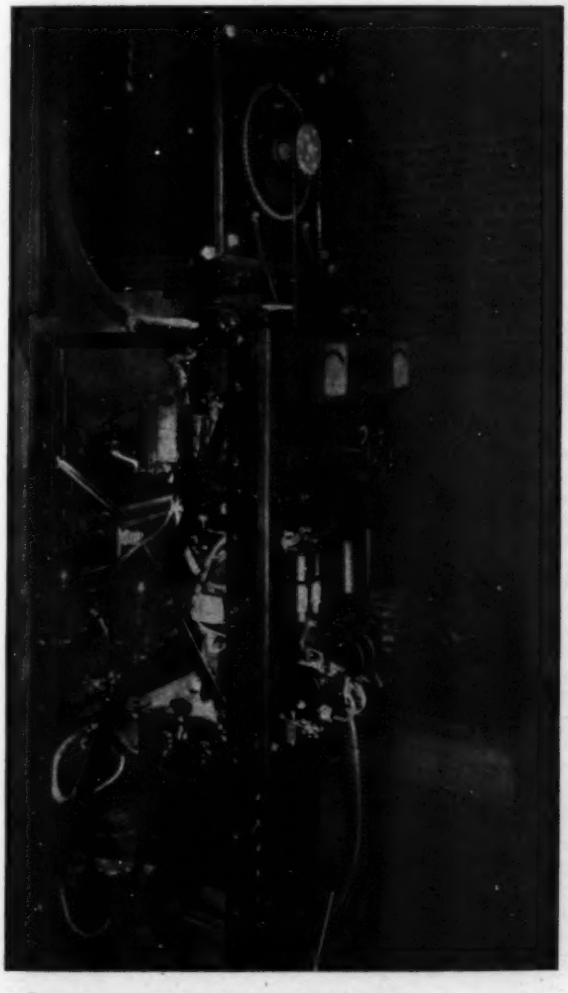
starting torque is required to break the machine away from rest. This relatively low starting torque permits the design of a starting winding which has a low inrush current and high starting efficiency, and permits the concentration of the torque at the pull-in point where the motor has to synchronize while carrying a load of high inertia. The concentration of torque at the pull-in point is a desirable characteristic for another reason; chippers sometimes have to operate on power systems which are subject to frequency or voltage fluctuations. These fluctuations may cause the chipper to drop out of step momentarily and unless the motor has a high pull-in torque, it will not resynchronize on the squirrel cage winding.

Both the rotor and the stator of the motor are designed to withstand the tremendous mechanical vibrations to which the whole machine is subjected during operation. The stator coils themselves are protected by steel bracing rings which are mounted behind the coils and to which each coil is laced.

The design of the rotor starting winding or squirrel cage winding presented a special problem in itself. Torque characteristics, a heat storage capacity and mechanical strength all had to be considered and provided for. By the selection of the proper alloy for the squirrel cage winding bars, the torque characteristics of the motor are so arranged that the motor has a reasonably low starting torque and low starting current and a high pull-in torque. The heat storage capacity of the winding and the mechanical strength are allied inasmuch as the winding is made of several times the usual cross section to provide the mechanical strength necessary to withstand the mechanical vibration and it automatically possesses the heat storage capacity required for frequent starts and for the work done in accelerating the heavy flywheel. The squirrel cage bars are carried out well beyond the coils of the field winding to provide for proper radiation to dissipate the heat generated during acceleration and to provide the necessary space for mounting the heavy end ring which connects the bars at the end.

This end ring is made of relatively large cross section and is bolted at the joint with two or three times as many bolts as would normally be used in a motor designed for ordinary industrial service.

The control equipment must fulfill many exacting duties in order to enable it to properly control the operation of the motor direct connected to a wood chipper. The custom is to use full voltage starting for the motor. The reason for this is that the torque output of the motor during starting and acceleration is of extreme importance, since it must allow the motor to get the chipper disc up to speed and consequently the full capacity of the starting winding must be utilized. As previously stated, the synchronous motor is designed to have a low starting torque and consequently if logs are left in the chipper or thrown onto the disc before the machine is started, it is possible to stall the rotor and prevent it from starting. To protect the motor against overheating with the rotor stalled in this way, a stalled rotor protective relay is provided as part of the control equipment. After a definite time has elapsed, this relay will automatically remove the motor from the line before the rotor winding overheats. Should a serious dip of voltage on the power system occur simultaneously with a high peak load on the chipper, it may cause the motor to pull out of step. If this happens the motor may have to resynchronize under load and in order to do this the full pull-in torque of the squirrel cage winding is necessary. With field excitation applied to the rotor, this pull-in torque characteristic is not available. Thus the control equipment must provide for the removal of field excitation from the motor at this time and protective relays are provided on the control panel to automatically remove the excitation when the motor pulls out of step and to enable the motor to resynchronize automatically on the squirrel cage winding.



Automatic full voltage starter with stalled-rotor and pull-out protection for synchronous motor chipper drive

In addition to the special protective relays which have been described for protecting against stalled rotor conditions and pull-out conditions, thermal overload relays are provided on each control panel to protect the motor against sustained overload which might cause the stator to overheat and eventually burn out. Where automatic motor operated conveyors are used for feeding logs into the chipper, the control is readily interlocked so that if the synchronous motor pulls out of step, the conveyor is stopped, preventing continued overload and any difficulty in resynchronizing on the squirrel cage winding. Undervoltage protection by an instantaneous or time delay relay is provided on these control panels and is, in fact, the standard protective feature for this condition.

This combination of motor and control marks another forward step in the complete electrification of the paper mill. This constant speed drive of relatively large horsepower rating provides a splendid place for the application of a synchronous motor which assists in maintaining the plant power factor at a high value, and by so doing, compensates for the lower power factor of a number of smaller induction motors. By using a direct connected motor, the maintenance charges may be considerably reduced because the total number of bearings is reduced by at least 50 per cent and the belt drive is completely eliminated. The space requirement is reduced by more than one half. At a time when operating economy is of paramount importance and when the advisability of building expansion is problematical, the adoption of the direct connected chipper motor provides one means whereby production may be increased without excessive capital expenditure.

# Technical Association Convenes for 1934 Convention

**Nineteenth annual meeting featured by large number of well prepared papers which drew representative attendance at regular and divisional sessions.**

THE program of the 19th annual convention of the Technical Association of the Pulp and Paper Industry, held at the Waldorf-Astoria Hotel, New York, proceeded with clock-like precision from the opening of the convention on Monday morning, February 19, to and including the annual luncheon on Thursday, February 22, which brought the meetings to a close.

Each of the various papers presented before the convention showed the result of careful preparation, and in toto were of sufficiently varied character to have something for everyone who in any way might be interested in the technical phases of pulp and paper making. Surely, the program committee, the contributors of papers, and those who saw to it that the meetings were held with the alacrity of train dispatching are to be congratulated both individually and jointly for their efforts.

## Symposium on Paper Classifications and Standards

The four-day program started with a symposium on Paper Classifications and Standards, which was conducted as a joint meeting of the Technical Association of the Pulp and Paper Industry and the American Paper and Pulp Association and its associate members.

Mr. S. L. Willson, President of the American Paper and Pulp Association, was honorary chairman of this joint meeting, while Allen Abrams, President of T.A.P.P.I., presided.

Mr. Abrams, in calling the meeting to order, spoke briefly on the subject of paper grading and then called upon C. W. Boyce, Executive Secretary, of the American Paper and Pulp Association, for his introductory remarks. Mr. Boyce stressed the paper code situation and suggested that the industry had never undertaken before the study of its products on such an important scale. He emphasized the fact that the standardization of paper grades was one of the most difficult standardization jobs of American industry.

Mr. Boyce further told of the need for carefully defining tolerances, and stated that another most important aspect in this program of standardization was the need for adequate financing.

In the opinion of Mr. Boyce, such a program was the best investment that the paper industry could make in extending the uses of paper.

### Quality Standards

Following Mr. Boyce's remarks, Mr. Abrams called upon W. E. Emley of the U. S. Bureau of Standards in the absence of Dr. L. J. Briggs, Director, to read Dr. Briggs's paper on the "Development and Use of Quality Standards."

In this paper, it was pointed out that standards should be intelligent to both parties; that they should not be ambiguous; that specifications should be written from the standpoint of the consumer rather than that of the manufacturer and that they should be intelligent to both manufacturers and the public alike. Such specifications, it was said, should consist in so far as possible of performance requirements only, and that the difference between grades should be based on serviceability.

The facilities of the Bureau of Standards to the limit of its ability was placed at the disposal of T.A.P.P.I. in the writing up of these specifications.

Three other papers were presented before this joint meeting, the first by J. E. Plumstead, Manager, Jessup & Moore Paper Company, on "Economic Significance of Paper Specifications"; the second by P. K. Baird of the Forest Products Laboratory, on "Use Requirements of Paper"; and the third by F. C. Clark of Skinner & Sherman, Inc., on "Trade Names and Their Significance."

### Paper Specifications

Mr. Plumstead in presenting his paper immediately questioned, "Is paper making an art or a science?" and then proceeded with "It is an art," says the maker of cover specialties; and "It is a science," contradicts the roofing felt manufacturer.

In the opinion of Mr. Plumstead, paper specifications must start in the laboratory, and must follow through the paper-making process and into the warehouse, where the product must be approved for delivery or otherwise disposed of if substandard quality. He also pointed that paper specifications might be of economic value to the paper manufacturer alone in standardizing his product; to the paper manufacturer and paper buyer jointly to insure satisfactory service and to prevent disputes; and to competitive paper manufacturers jointly as a basis for the establishment of competitive grades.

### Paper Use Requirements

Dr. C. E. Curran, In Charge, Section of Pulp and Paper, Forest Products Laboratory, after being introduced by Mr. Abrams, called upon Mr. Baird of the Laboratory staff to present the paper on "Use Requirements of Paper." Mr. Baird told of the survey that he had made for the purpose of delineating sheet properties, listing of these properties in order of their importance, selection of standard test methods, and the establishment of minimum and maximum values for each standard. He said that an analysis of the returns from the questionnaire which listed fifty-four sheet properties showed that finish, color, bursting strength, ream weight, formation, and cleanliness in the order named were considered by manufacturers of greatest importance.

At this point in the program the meeting was thrown open for discussion. One delegate called attention to the sheet properties as set up by the paper manufacturer in the order of their importance and stated that the ultimate consumer should be active in this work on use requirements, suggesting that the printer, for example, was primarily interested in sheet characteristics considered of lesser importance by paper manufacturers. F. C. Clark called attention to the widely divergent opinions on this subject and to the endless task of arguing physical tests. He proposed that it should be possible for each group of manufacturers and consumers to consider as many different varieties of any specified class for the purpose of arriving at definite agreements as to tentative standards for it.

### Significance of Trade Names

Following the discussion of Mr. Baird's paper, Mr. Clark presented a digest of a most intensive study of "Trade Names and their Significance." The paper industry, said Mr. Clark, like all old industries, has grown largely as a result of consumer demands, various kinds and grades of paper being developed to meet the special requirements of a consumer. These kinds and grades have then found immediate application for uses that were entirely unrelated to those uses for which the paper was originally developed. This practice, continued Mr. Clark, has led to the application of various names to these papers, and generally the name applied was indicative of the purpose for which the paper was used. Kraft wrapping paper was cited as an example of one variety of paper from which sixty-five or more trade-named papers were cut from regular runs of stock. These names developed confusion and this confusion was

further increased because many of these same papers, under the names given, might be found to be made wholly or partly of rope, unbleached sulphite, and groundwood pulps.

There is obviously a certain relationship, said Mr. Clark, between all papers made and therefore all trade names used. To establish such a relationship would overcome much of this name confusion that now exists and would give to the industry a common language, easily understood and easily applied to many every day problems.

The history of paper classification was briefly reviewed. Then Mr. Clark suggested a classification plan in which all papers were divided into ten major groups called types; each type was then divided in ten subdivisions, where necessary, called Classes; and each Class might be further subdivided into ten subdivisions called Kinds.

The ten types of paper in the order given included boards, book-printing, bristol, building, cover, news, tissue, wrapping, writing and industrial.

After explaining the principal combinations of the board group, Mr. Clark proceeded to show how a paper classification chart could be used to designate definitely by numerals every paper mentioned in the chart, and explained how the chart might be expanded to include every paper now produced.

C. C. Heritage of the Oxford Paper Company complimented Mr. Clark on the excellent start he had made in taking the common trade names of paper, mysterious and duplicating as they are, and putting them into a system. Miss Helen Kiely of the American Writing Paper Company stated that her company had been using a system somewhat similar to that outlined by Mr. Clark for the past ten years; that the system works very satisfactorily; and that every paper has a grade number. It was further brought out that The Bogalusa Paper Company was using a somewhat similar system and that it proved valuable in correlating the work of the technical and sales departments.

The discussion following Mr. Clark's paper completed the morning meeting of the first day, but the afternoon meeting which was called to order at 2:30 P. M. was also devoted to the symposium on paper classifications and standards.

### Paper Imports

Lt. Col. Warren B. Bullock, Manager of the Import Committee of the American Paper Industry, was the first speaker of the afternoon program. He briefly outlined the function of the Import Committee and suggested that the Tariff Act of 1930, under which duties on foreign merchandise were now being collected, provided for approximately 170 different kinds of paper. Therefore, the first question that a custom's official must ask in deciding what rate of duty is to be levied is, "What kind of paper is it?"—a wrapping paper being dutiable at one rate, a writing at another.

Difficulty arises, however, when the customs official is faced with the determination of a paper which is so close to the border line between two grades that the importer may claim it to be something which it is not. Then that official, said Mr. Bullock, must have some yardstick of classification by which to classify paper.

He cited a typical case of the kind just mentioned, emphasized the economics of the situation, and stated that the task of the Import Committee as well as that of the Custom officials would be greatly simplified if there were definitions of various grades of paper, so phrased that they could be used by those officials in the analysis of a shipment of any foreign paper.

### Viewpoint of Merchant

The Merchant's Viewpoint on this subject of standardization was presented by Charles Addoms, Treasurer of the National Trade Association following the remarks of Lt. Col. Bullock and the discussion of his paper. Standardization, in the words of Mr. Addoms, is not new—it was a live topic during the war. The paper industry, said Mr. Addoms, has contributed its part on standardization and it will continue to do so. Both manufacturers and merchants realize the need for the exchange of ideas.

Mr. Addoms in continuing his remarks stated that standardization of sizes, weights, color, etc., had eliminated to some extent the private brand. He referred to the troubles of printers and merchants and suggested in concluding his remarks that standardized methods would perpetuate the existence of the industry.

### Facilities of T.A.P.P.I.

T.A.P.P.I. Facilities for Developing Standards was the subject of C. C. Heritage, the next paper of the symposium. Mr. Heritage reviewed the present situation in the industry; stated that the operation of the industry under the code had presented certain basic problems; and that the stabilization of price required a stabilization of quality. To this end, Mr. Heritage suggested the need of a yardstick for grades that would be fair to all, and at the same time simple, workable, precise, and easily understandable. A clear picture of grade standards (a term coined within only the past few weeks) must be obtained, said Heritage. These standards, in his opinion, might be based on raw materials, processes, or properties of the finished products. The practical aspects of the problem, continued Mr. Heritage, may require the use of raw material data to secure a workable answer even though the properties of the products themselves offer the simplest means of defining grades.

In outlining a procedure for developing grade standards, he suggested that a study of use requirements which were capable of description in ordinary lay English might be the starting point; then there would be the technical job of correlating the properties of the sheet with its use requirements, and placing values upon them.

Mr. Heritage then told how T.A.P.P.I. functioned as an organization, mentioned the work of the several divisions, called attention to the Manual of Standards, and expressed the interest of T.A.P.P.I. as an organization in functioning as a correlating agency in the work of paper grading.

### Discussion

The meeting was thrown open for criticisms and suggestions by Mr. Abrams as soon as Mr. Heritage had presented his paper. The discussion which followed was particularly interesting and helpful since it brought out several differences in points of view.

Opposition to grade standardization came chiefly from H. J. Miner, Sales Manager of the Munising Paper Company, and J. H. Slater, General Manager of the Escanaba Paper Company.

In the opinion of Mr. Miner, the standardization of grades was a step in the wrong direction since manufacturers should strive at all times to improve their products. The only method of grading was one of materials, such as 100 per cent rag, 100 per cent sulphite or whatever it might be, said Mr. Miner, because any standardization based on results would put an end to personal or company initiative.

At present, Mr. Miner continued, that their problem with sulphite bond was how to degrade it to comply with the requirements for grades of lower price. He brought out the fact that it cost $5.00 more per ton to make the inferior product, but this product could be merchandised.

Mr. Slater supported the remarks of Mr. Miner and suggested that the standardization of methods was the proper thing, but standardization of grades of paper was in the wrong direction.

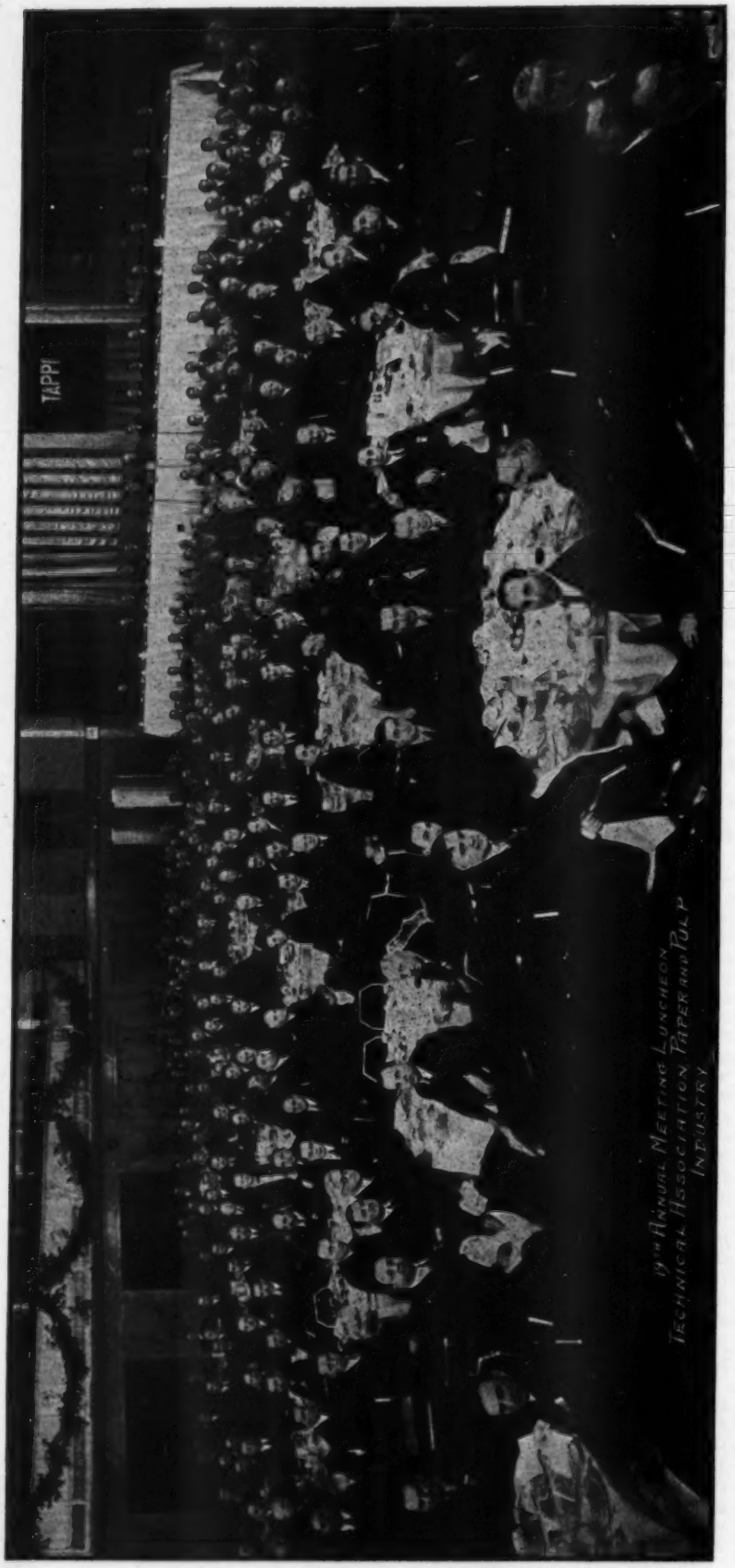
It was also pointed out by others that the industry would be in danger if too close standards were set, and that right now it was impossible to use the sales argument of higher quality—higher price.

### Viewpoints of Converter and Consumer

This very interesting discussion was followed by a paper by N. H. Stuart, Purchasing Agent, Remington-Rand, Inc., on the "Converters and Consumers Viewpoint." Mr. Stuart told of the paper requirements of investment houses, public utilities, industrials, and schools and colleges; and explained that he represented both a converting and consuming organization. Some mills, said Mr. Stuart, were reluctant to work to specifications, but it was his belief that papers should be specified on a basis of use requirements and permanence. In addition, he suggested a change in the substance weights of bonds and writings.

### Paper Manufacturer's Viewpoint

After a brief recess, following Mr. Stuart's paper, Ernst Mahler, Vice President of the Kimberly-Clark Corporation, presented the "Paper Manufactur-




er's Viewpoint." Overproduction, price cutting and "upping the grade," the latter two being termed methods of cheating, were the three evils with which he was concerned. Mills, said Mr. Mahler, that are going to produce new and better products should be entitled to profit by that work, and that fruits of effort were going to come again to the leaders of the industry.

It was Mr. Mahler's concept that the paper manufacturers' viewpoint and that of the purchasers should be the same—that the manufacturers must be in a co-operative frame of mind with the purchasers and that the purchasers should become somewhat technically minded. He emphasized further the need of suitable instruments and tests for control purposes, and stated that the success of the individual mill was dependent upon the service it rendered to its customers.

### Sulphite Bond and Book Paper

M. A. Krimmel of the Hammermill Paper Company spoke briefly on the work of the sulphite bond grading committee, suggesting that the committee was going to recommend that a new classification for grades be adopted but that he was not at liberty to divulge the recommendations at that time.

The work of the book paper association was next on the docket, and was presented by H. P. Carruth, Vice President of the Mead Corporation. Mr. Carruth explained that the grading of products was one of gradual evolution over a period of years; suggested that the use of a product was the dominating factor in grading; and recommended that any specification adopted should be considered only temporary as grading must never prohibit the development of the industry.

### Preparation of Paper Standards

The last formal paper of the symposium was on the subject of "Preparing Paper Standards" and was presented by Dr. H. M. Wriston, President, Institute of Paper Chemistry. Dr. Wriston stated that the Institute was prepared to cooperate in this matter of paper standards; that it was both a research and educational institution; that its equipment was unrivalled; and that its staff was unexcelled. He stressed the inadequacy of instruments to determine accurately paper characteristics; the need for simpler instruments to permit easier checking and easier reading; and that tests must be made on a more and more accurate basis. He further pointed out that the Institute was the official testing station for several grades in this code work and that over 100,000 tests had already been made.

The activities of the day were briefly summarized by Mr. Abrams and after a short discussion a most helpful symposium on "Paper Classification and Standards" was brought to an end.

## Second Day's Program

The morning of February 20 was given over to a general session over

which Allen Abrams presided, and during which the report of the secretary, address of the president, report of joint textbook committee, and development reports of each division of T.A.P.P.I. were presented.

In presenting the secretary's report, R. G. Macdonald stated that 114 members were elected to T.A.P.P.I. during 1933 and that 139 members had resigned or were dropped from membership. Five members—T. J. Keenan, E. A. Bergholtz, F. C. Farnsworth, W. L. Nixon, and J. A. Fux were lost by death during the year. The total individual membership on December 1, 1933, was said to be 1,068.

Mr. Macdonald also reported on the service rendered by the association office in the way of special reports and service to members; told of moving in December, 1933, from 370 Lexington Avenue to the Chanin Building, 122 East 42d Street, in order to keep the association's headquarters close to those of the American Paper and Pulp Association; mentioned briefly the successful 1933 fall meeting at Appleton, Wisconsin; and discussed matters of articles of organization, employment, publications, cooperative activities, and activities of the various sections and divisions.

### President's Address

Mr. Abrams, in presenting the President's address, told of the activities of T.A.P.P.I. during the strenuous year through which we have passed, and particularly emphasized the excellent work of several committees, including the Paper Use Requirements Committee, the Permanence and Durability Committee, the Patents Committee, the Education Committeee, and the Pulp Testing Committee. In addition, reference was made to the valuable service being rendered in their respective fields by committees on Management Methods, Heat and Power, Preparation of Non-Fibrous Materials, Stuff Preparation, Fundamental Research, Paper Testing, Non-Fibrous Materials Testing, and Coating.

He mentioned the work of the Central Research Committee of the A. P. P. A.; the fall meetings of T.A.P.P.I. for the past several years, together with the 1934 meeting to be held at Portland, Oregon; the activity of T.A.P.P.I.'s sectional organizations; the progressive spirit of the Pacific Coast section; the trip to Savannah to view the work of Dr. C. H. Herty on the production of sulphite and groundwood pulps from southern pines; and the problem of paper grading as brought about by the code. He prophesied the ascendency of chemical derivatives of wood cellulose, and viewed the introduction of the new philosophy in business with hopefulness.

### Committee and Divisional Reports

Mr. Abrams called upon Mr. Macdonald to present the report of the Joint Textbook Committee in the absence of R. S. Kellogg, Chairman. In this report it was stated that 23,981 copies of the textbook, *The Manufacture of Pulp and Paper*, had been sold to date, that 52 copies of Volume I, 53 copies of Volume II, 124 copies of Volume III, 120 copies of Volume IV, and 79 copies of Volume V were sold during 1933.

It was brought out in the discussion following the presentation of this report that Volumes III and V are now in process of revision and that suggestions should be sent to J. N. Stephenson, Editor of *Pulp and Paper of Canada*, Gardenvale, Que. Considerable discussion also centered around the distribution of the special service reports of T.A.P.P.I. The suggestion was made that it would be a good idea if all of the reports issued to date were published; that copies of all special reports be sent to each member of the various committees to stimulate committee interest; and that copies of all special reports be sent to the U. S. Patent Office for reference. It was also brought out that T.A.P.P.I. had in mind the publishing of a Management Bulletin to inform executives on what is going on in the technical field of pulp and paper making.

Following this discussion period, W. M. Shoemaker of the National Vulcanized Fibre Company reported on the activities of the Management Division, M. H. Teaze of Hardy S. Ferguson & Company for the Engineering Division, Dr. J. L. Parsons of Hammermill Paper Company for the Raw Materials Divisions, F. C. Clark of Skinner & Sherman for the Operating Division, Dr. C. E. Curran of the Forest Products Laboratory for the Research and Development Division, Roger Griffin of A. D. Little, Inc., for the Testing Division, and A. W. Nickerson of the Robert Gair Company for the Converting and Consuming Division.

The presentation of these development reports completed the morning session and with the exception of the annual luncheon on Thursday, February 22, the rest of the convention was given over to sectional or divisional meetings.

The afternoon meetings of Tuesday, February 20, included sessions by the Engineering Division, Management Division, and the Converting and Consuming Divisions. Five papers were scheduled for presentation before the Engineering Division meeting over which M. H. Teaze presided, three papers before the Management Division with W. H. Shoemaker presiding, and three papers before the Converting and Consuming Division with A. W. Nickerson and J. J. O'Connor presiding.

### Engineering Division

The subjects scheduled to be covered in the papers read before the Engineering Division meeting included "Modern Lighting Practice in Pulp and Paper Mills," by W. S. Hadaway of Westinghouse Lamp Company, "Switchgear Developments of Interest to the Pulp and Paper Industry," by G. M. Reed of the General Electric Company, "Flat Belt Drives," by F. W. Parkhurst of Rockwood Manufacturing Company, "Aluminum Foil for Heat Insulation," by J. F. O. Stratton of Ross Industries Corporation with discussion by E. B. Swenson, Aluminum Company of America, and "Standard and Comparison Power Plant Reports," by A. G. Darling, Chairman, T.A.P.P.I. Heat and Power Committee.

Mr. Hadaway in his paper on Modern Lighting Practice in Paper Mills stated that insurance company statistics show that poor lighting is responsible for 18 per cent of all industrial accidents. Mentioning that the unit of measure for illumination was the foot candle, he proceeded to tell how illumination in the factory might be measured directly in foot candles through the use of a small inexpensive meter actuated by a photo-electric cell. The selection of lighting equipment for industrial interiors and offices was also touched upon. In this regard it was stated that the RLM reflector was the type of reflector most widely used today for general illumination purposes in mills and factories, while office lighting equipment was divided into two main classes—direct and indirect—the only possible disadvantage of direct lighting being that of glare.

Wiring to provide for the economical distribution of electrical energy and the maintenance of the level of illumination were two other points stressed by Mr. Hadaway in his paper.

Mr. Reed in his paper on Switchgear Developments of Interest to the Pulp and Paper Industry stated that the trend in modern switchgear development was exemplified by the increasing use of equipments shipped completely assembled, and toward the use of enclosed switchgear thus offering excellent protection to apparatus and to operators. Improved methods of arc interruption in oil circuit breakers, better contacts, better insulation and the use of enclosures have all combined, said Mr. Reed, to result in lower maintenance. He also suggested that the accessibility of parts in both open and enclosed equipments had not been lost sight of, even though more compact designs were now being produced.

Mr. Parkhurst in his paper on "Flat Belt Drives" listed long life, dependable operation, flexibility, easy accommodation to desired centers, minimum maintenance attention and cost, simplicity of installation, quiet operation, clean, minimum power absorbed in drive, capacity for overloads and several other equally important factors as the inherent characteristics of properly chosen and maintained flat belt drives. He stated that the general tendency in determining belt size had been to apply belt manufacturers' recommendations as to belt capacity against nominal or average loads instead of the peak loads to which a drive would be subjected. He also stressed the effect of belt speed on necessary tension, and described the three general methods of maintaining proper tension in motor drives, namely: slide rails with manual adjustment, idlers weighted or spring tensioned, and pivoted mounting for the motor. With the pivoted type of mounting, said Mr. Parkhurst, it was possible to establish the minimum tension that will pull the maximum load without appreciable slip,

and to keep this correct belt tension constant once it has been established.

Aluminum Foil for Heat Insulation, as stated previously, was the subject of J. F. O. Stratton. In his paper, Mr. Stratton outlined the history behind the use of aluminum foil for insulation, stating that it was the ultimate development of the application of a theory propounded as far back as 1850, when Peclet, a European scientist, recognized the principle which accomplishes thermal insulation by the reflection of radiant heat from a bright surface. Efficient insulation was obtained with Alfol (a trade name for aluminum foil), said Mr. Stratton, not only by the high reflectivity of its surfaces, but also by the additional insulating effect obtained in the air spaces between the various layers—the aluminum foil when applied being usually crumpled so that three layers take up an inch thickness of space. It was further pointed out that Alfol insulation would not disintegrate, rot, warp, or settle; and that vegetable and bacterial growth could not form within it. Aluminum foil in the opinion of Mr. Stratton is a distinct advance in thermal insulation media, and its use combines simplicity of application and high efficiency, permanence and durability with added economic value from a commercial aspect.

The last paper scheduled before the engineering divisional meeting on the afternoon of February 20 was that by A. G. Darling covering "Standard and Comparison Power Plant Reports."

**Management Division**

The three papers scheduled for presentation before the Management Divisional meeting included: Standardization of Materials Purchasing Specifications, by A. E. H. Fair; Co-ordination of Research, Technical Control and Mill Operation, by K. A. Taylor, Oxford Paper Company; and a Symposium-Organization and Operation of Training Program for the Industry, led by H. G. Noyes, Personnel Manager, Oxford Paper Company.

Mr. Fair in presenting his paper on Standardization of Materials Purchasing Specifications outlined the progress made and desired relative to establishing specifications for such materials as wood, pulp, alum, sizes, felts, wires, coal, and lubricants—these materials entering directly or indirectly into the manufacture of pulp and paper. General pulpwood specifications, in the opinion of Mr. Fair, could not be formulated to apply to the whole industry; but standard specifications for the majority of the materials used in chemical wood pulp manufacture, with perhaps the exception of limestone, actually existed although they were not officially recognized. Before standard pulp specifications can be suggested there must first be accepted standard pulp testing methods, said Mr. Fair. In speaking on specifications for equipment and materials other than those which enter directly into the manufacture of paper, he suggested that an expression of opinion requested from a number of mill managers showed them to favor a more general standardization of materials purchasing specifications. There was, however, some difference of opinion as to whether any attempt should be made to standardize purchasing specifications for any of the materials used in the industry.

In presenting his paper on "Co-ordination of Technical Control, Research and Development with Practical Mill Operation," Mr. Taylor classified technical work under four major headings—routine testing and control, sales development, cost reduction, and new sources of profit. The problem of co-ordinating these technical activities with mill operation was considered as a responsibility of the management, and to this end the various problems of co-ordination were outlined and discussed. The attitude of the management, selling the operating superintendents and practical operators on the value of technical work, selection and organizing of technical staff, organizing technical and operating staffs to work together harmoniously, and planning and carrying out of the technical program were the major points in this matter of co-ordination that were touched upon.

The symposium on the Organization and Operation of Training Program for the Industry was the last activity scheduled on the afternoon program of the second day before the Management Division.

**Converting and Consuming Division**

Three papers were read before the Converting and Consuming Divisional group.

The first paper, "Container Standards," by Pierre Drewsen of Hinde and Dauch Paper Company, was read in his absence by J. D. Malcolmson, Director of Research of the Robert Gair Company, Inc. In this paper three specifications for the testing of container board were recommended. One specification included a method for making moisture vapor transmission tests at 50 per cent relative humidity 70 deg. Fahr.; another specification covered the testing of container board for bursting strength; and the third covered the conditioning of corrugated and solid fibre samples.

In the specifications covering the method for making vapor transmission tests, apparatus and materials for making the test were given, and the procedure described in minute detail. It was pointed out in submitting the specifications for bursting strength of container board that, in general, they conformed to the official T.A.P.P.I. standard T-403-M, "Bursting Strength of Paper," except that a "Jumbo" tester should be used. Double-faced corrugated board, on the other hand, because of its more complicated structure, was said to require special treatment in the determining of bursting strength and the deviations from T-403-M when applied to this product were then described. Clamp pressure, location of test, size of tester, and calibration were the major points touched upon.

The draft of specifications for the conditioning of corrugated and solid fibre samples covered the effect of relative humidity and temperature together with the recommendation that the test specimens should be conditioned in an atmosphere of 40 per cent relative humidity to produce samples within the range of 6½ and 7½ per cent moisture content. The methods recommended for conditioning and the determination of humidity and temperature conformed to T.A.P.P.I. methods T-402-M except that the word "board" be substituted for "paper."

An alternate approximate method of conditioning samples where constant humidity rooms were not available was also given. In this case, it was stated that each specimen of the board sample after preparation for application of the test should be suspended in a covered jar over a saturated solution of calcium chloride for a period of at least twenty-four hours, at a temperature of between 20 and 25 deg. C. (68 to 77 deg. Fahr.). The specimens should be suspended in such a manner as to permit all surfaces to be in contact with the conditioning atmosphere and, in addition, a free air circulation between the individual pieces. After a twenty-four-hour period of conditioning, the test specimens should be removed from the jar one at a time and tested immediately.

It was understood that each of the three specifications mentioned would be considered as tentative for at least a year, after which, if no changes were made, they might be made permanent.

The presentation of these tentative test specifications for board aroused considerable interest and, following the discussion pertaining to it, Mr. Nickerson turned the meeting over to Mr. O'Connor of The Mead Corporation, who briefly outlined the activity of the coating committee during 1933 and told of the plans for 1934.

Following these remarks, a paper entitled, "Viscosity Testing of Coating Color," by Parke Dunn and C. G. Landes, of the Mead Corporation, was read by Gerald Hayward of the West Virginia Pulp and Paper Company, after which H. F. Vieweg of Rutgers University presented an illustrated stereopticon talk on "Determination of Particle Size of Minerals Used in the Manufacture of Coated Paper." Professor Vieweg briefly surveyed the methods employed at Rutgers for making these determinations, and gave some information on the results obtained in making such determinations with clay.

## Meetings of Third Day

The sectional meetings of the third day of the convention were given over largely to the presentation of papers, four being scheduled before the operating and engineering group meeting in the morning, and eight before the testing division meeting which was held at the same time.

**Operating and Engineering Divs.**

The morning session of the operating and engineering divisions was presided

over by F. C. Clark and M. H. Teaze. The schedule of papers before this group included a paper on the "Rate of Drying Newsprint," by F. W. Adams of the Massachusetts Institute of Technology; another on "Auxiliary Drive for Cylinder Machine," by A. Suter of Bogalusa Paper Co. and D. R. Shoults of the General Electric Co., a third on the "Use of White Water on Cylinder Machines," by F. C. Stamm of the Upson Company, a fourth on "Heat Utilization in Pulp Cooking by the Sulphite Process," by O. L. Berger of G. D. Jenssen Co., and a fifth on "Heat Utilization in Alkaline Pulping," by W. T. Webster, of J. O. Ross Engineering Corporation.

In Professor Adams' paper on "The Rate of Drying Newsprint" it was stated that production and evaporation rates in drying newsprint increased with steam temperature and that these rates were considerably greater than those for kraft and board. Steam temperature was said to be unquestionably the greatest single factor affecting drying rates. Production was found to decrease as the length of the machine increased, the length being expressed as square feet of covered dryer area per inch of width. Data was also collected on cleanliness of dryer surface, drainage conditions in the dryers, hoods and special ventilating systems for the machine room and felts, felt dryer rolls, and hydration of stock, but many of these variables were not susceptible of measurement.

Mr. Shoults presented the joint paper by Mr. Suter and himself on "Auxiliary Drive for Cylinder Machine." In brief, the paper consisted of a description of the layout and the operation of an auxiliary motor drive for the cylinder molds and primary suction rolls of the recently remodeled No. 1 board machine of the Bogalusa Paper Co. The use of this auxiliary driving equipment was said to permit the use of a more open type felt, and that the felt cost of the machine as a whole had dropped to a fraction of its previous cost.

Profound ignorance on the "Use of White Water on Cylinder Machines" was professed by Mr. Stamm when he started to present his paper, but before completing his remarks he revealed that he had had much experience on the subject. The tangible advantages of white water utilization were stated by Mr. Stamm to include savings in stock, alum, temperature, and in the cleaning up of sewers and streams. Among the disadvantages he listed possibility of foaming, freeness troubles, plugging up of cylinders, slime difficulties, sizing variations, and effect on hydration.

According to C. M. Baker, the advantages and savings resulting from white water utilization more than overcame the disadvantages; cylinders could be cleaned as well with white water as with fresh water if showers are properly located; slime could be controlled in any mill by proper chemical treatment; and that the solution of the foam, sizing and hydration problem hinged on the chemical adjustment of whitewater.

A reduction in water requirements from 16,000 gallons per ton of board to 7,000 gallons in the past three years was cited by one mill executive as to what had been done in the mill with which he was identified. Numerous other comments were made, one by L. M. Booth to the effect that he did not believe that there was any such thing as an ideal paper mill fresh water or an ideal whitewater and that more study should be exercised on the needs of water in a paper mill. H. A. Morrison of Oliver United Filters, Inc., called attention to the rather loose terminology in speaking of white water and expressed the feeling that best results in its utilization could be secured if the water was freed from as many insolubles as possible.

"Heat Utilization in Pulp Cooking by the Sulphite Process" was the subject of the next paper, and as stated previously was presented by O. L. Berger. Mr. Berger pointed out that digesters varied in size from 3 to 30 tons; that steam consumption in sixteen mills without any method of recovery varied all the way from 4,250 to 8,500; and that a saving of around 2,000 pounds of steam per ton of pulp might be expected from the use of recovery systems. He also brought out the fact that large digesters seemed to require less steam per ton than the smaller ones.

Mr. Berger called upon G. L. M. Hellstrom, T. L. Dunbar of Chemipulp, and A. R. McAllister of Kimberly-Clark for remarks following the presentation of his paper.

The last paper scheduled before this divisional group meeting was that on "Heat Utilization in Alkaline Pulping," by W. T. Webster. Digester sizes in soda mills were stated in this paper to range from 500 cubic feet and yielding 1,600 pounds of pulp to 3,420 cubic feet and yielding 8.5 tons; while in sulphate mills they varied from 1,235 cubic feet to 3,000 cubic feet, the former yielding 2.9 tons and the latter, 7.0 tons.

The larger digesters in the case of the soda mills used from 3,800 to 5,800 pounds of steam per ton of pulp, while steam requirements from 2,400 pounds to 6,000 pounds per ton were reported for sulphate mills.

Mr. Webster suggested that any mill using more than 4,000,000 B. T. U. net per ton of pulp for cooking could profit by a careful study of the cooking process and the heat utilized in cooking pulp.

### Testing Division

The papers scheduled before the Wednesday morning meeting of the Testing Division over which R. C. Griffin, H. W. Morgan, and B. W. Scribner presided, were:

"Rapid Methods for the Determination of Bleached and Unbleached Fibers in Pulp and Paper," by M. S. Kantrowitz and R. H. Simmons, Government Printing Office.

"A Sizing Test and a Sizing Theory," by R. M. Cobb and D. V. Lowe, Lowe Paper Company.

"Water Resistance of Paper Board," by P. W. Codwise, Beaver Wood Fibre Co., Ltd.

"A New Electric Finish, Formation and Plano-Radial Porosity Tester," by F. M. Williams, Williams Apparatus Company.

"Processing Variables in Evaluating Pulps by the Pebble and Rubber-Covered Ball Methods," by F. A. Simmonds and P. K. Baird, Forest Products Laboratory.

"A Comparison of Several Methods for Processing Pulp Test Samples," by H. W. Morgan, New York State College of Forestry.

"Bleach Requirement of Pulp," by C. O. Seborg, Forest Products Laboratory.

"Permanganate Number of Pulp," by R. H. Wiles, International Paper Company.

In the paper by M. S. Kantrowitz and R. H. Simmons, three rapid methods for the determination of bleached and unbleached fibers in pulp and paper were outlined, results of determinations made by using these methods and the official Bright stain tabulated, and factors for and against each method discussed. The stains used in these determinations included Malachite green, Malachite green-Congo red, and modified Bright stain. In summarizing the results of their study, it was stated that the official Bright stain required approximately one hour for staining; the Malachite green-Congo red stain developed by Sibert and Minor required approximately thirty minutes for staining; the method using Malachite green stain alone required not more than five minutes for staining; the Malachite green-Congo red stain using various concentrations of the Congo red gave results which were in error; a determination using Filz Method (Modified Bright stain) took approximately fifteen minutes; the results obtained using the Bright, Filz, and Government Printing Office (Modified Bright stain) methods showed close relationship; and that staining by the Modified Bright stain method allowed the fibers to be separated sufficiently from each other to permit the use of the count method in determining percentages of bleached and unbleached fibers.

The joint paper by Miss Cobb and Mr. Lowe on "A Sizing Test and a Sizing Theory" outlined a method for testing the liquid resistance of papers through the use of a 2 per cent sulphonated castor oil solution. The test, determining the amount of liquid absorbed in a given time, was said to be applicable to specimens that varied in thickness, and was particularly useful on all heavy stock on hard-sized light stock, and for sizing research on handmade sheets.

In Mr. Codwise's paper was given a detailed account of a method developed for the determination of the water resistance of paper board. Apparatus and materials for making the test were listed; instructions for preparing the specimen given; and the procedure for making the test described. A dry indicator powder was made up from 45 grams of pulverized tablet sugar (pulverized until it passed a 100-mesh sieve and then placed in a desiccator), and 5 grams of soluble starch and 1 gram of methyl violet dye prepared similarly. The sample to be tested was 3 in. x 3 in. The

procedure developed for making the test made it possible to observe the rate of water penetration through the sample by noting the discoloration of the dry indicator powder, the test being continued until a clear distinct circular darkened area was formed by the turning blue of the grains of the indicator below the area covered by water in contact with the specimen under test. The elapsed time from the beginning of the test until the end point was reached was reported as the water penetration test. Another method, suggested by the Bureau of Standards, was presented as an alternative method.

The next paper, scheduled before this meeting of the testing division, was presented by F. M. Williams, president of Williams Apparatus Co. Mr. Williams described his new electric finish and plano-radial porosity tester. He stated that the instrument measured both finish and porosity quickly and easily; and that it entirely eliminated variations in test due to human elements.

Determination of finish, said Mr. Williams, consisted in noting the time in seconds required to force a given quantity of air at definite pressure out between two surfaces of paper held together under definite hydraulic gauge pressure, the outside surfaces of the sample being sealed against the escape of air by soft rubber facings. Plano-radial porosity, noting the time in seconds required to force a definite quantity of air a certain distance through the intra-cellular structure of the sample in the plane of the sample, was distinguished from normal or through and through porosity. It was pointed out that this method of determining porosity had the advantage of overcoming variations in test due to irregularities in the sample such as pin holes, thin spots, etc. This instrument was further said to be readily adapted to all types of paper.

The paper, "Processing Variables in Evaluating Pulps by the Pebble and Rubber-Covered Ball Methods," prepared jointly by F. A. Simmonds and P. K. Baird, was presented by Mr. Baird. It included a collection of data from various experiments made for improving the procedure of the Forest Products Laboratory pebble mill test including its comparison with other processing units. These units were an Abbe pebble mill, a resilient-surfaced ball mill, and a beater of 20 lb. capacity. In the tests with the pebble mill, no correlation was observed between maximum bursting strength and a difference in jar volume over a range of from 1 to 14 per cent; variation in mill speed over a range of 50 to 60 r.p.m. was not critical; and for a given weight of pulp and pebbles consistencies from 2 to 4.5 per cent were suitable—above 4.5 per cent the rate of strength development decreased. Of the results obtained with the ball mill, the most interesting were said to be the remarkable qualities developed in the stock by the resilient-surfaced milling elements (rubber-covered lead balls). These qualities included high bursting strength, unusually high tearing strength retained at the point of maximum bursting strength, high opacity at maximum bursting strength, and high average fiber length.

Prof. H. W. Morgan of the New York State College of Forestry, in commenting upon a comparison of several methods for processing pulp test samples, mentioned several deficiencies of the flint pebble mill, and gave data to show how these could be overcome in other types of mills. In the work reported upon by Professor Morgan, a metal rod mill, a metal ball mill, a rubber-covered rod mill, and a porcelain ball mill were studied and the results compared to those obtained with the pebble mill. Development curves for strength and freeness were given. They showed that the rate of development with the metal rod mill and the rubber-covered rod mill were much more rapid than with the pebble mill, while the rate with the metal ball mill was much slower than with the pebble mill.

The paper, "Bleach Requirement of Pulp," by C. O. Seborg of the Forest Products Laboratory described a method designed to determine directly the amount of hypochlorite bleaching agent necessary to bring a pulp to a selected standard degree of whiteness. It was stated in this paper that the actual amount of bleach required by a pulp in a given commercial bleaching process might differ by 1 to 3 per cent from that determined by the method outlined because of process losses, differences in consistence, difference in water, and other factors.

Mr. Wiles in his paper on "Permanganate Number of Pulp" described a method adapted to the determination of the relative hardness or bleachability of pulp—the method being stated to work with practically equal ease upon all ordinary types and grades of wood pulp. It was also stated that the permanganate number was by definition the number of cubic centimeters of one-tenth normal potassium permanganate solution absorbed by one gram of oven-dry pulp under certain specified and carefully controlled conditions, and that this number might be readily converted into other terms, such as chlorine number, and per cent bleach consumption also used to denote relative hardness or bleachability. In discussing the precision of the test it was mentioned that measurements and titrations, in most cases, were made to the nearest 0.1 cc. with considerable accuracy; and that duplicate tests, run whenever possible, should agree to within 0.5 cc. Detailed instructions for the preparation of solutions required in making the test were also given.

### Operating and Research and Development Div.

The afternoon sessions of Wednesday, February 21, included the presentation of papers before the Operating and Research and Development division over which F. C. Clark and C. E. Curran presided and before the operating division with D. Manson Sutherland presiding. Before the first mentioned group five papers were scheduled for presentation, while three papers and a round table discussion were scheduled for the latter group.

"The Voith Pneumatic Stock Conveyor" was the title of the first paper scheduled before the Operating and Research and Development divisional meeting. It was the subject of Christopher Crusius of J. M. Voith Company. In this paper, problems incident to the handling of high density stock with pumps, screw conveyors, and belt trough conveyors were mentioned previous to describing the pneumatic system for use with stock consistencies of 18-20 per cent and upward. This system, utilizing compressed air, small pipe lines, and a high speed of travel, was said to be suitable for conveying groundwood, sulphite, sulphate, and soda pulps as well as all kinds of paper stock over distances up to 3,000 feet, the prepared stock entering individual pockets or compartments on the circumference of a rotary drum pulp feeder and discharged from the unit into the stock delivery line as soon as the individual pocket lined up with an air duct located at the lower end of the feeder.

"Reprocessing Printed Groundwood Papers" was the subject of S. D. Wells, Combined Locks Paper Co. In this paper Mr. Wells described a new process wherein groundwood papers printed with ink having the iron lake of haematein as a pigment had the ink removed by the reducing and acid action of sulphur dioxide on nodulized wet stock. In this process, rod mills were used to prepare the stock for the sulphur dioxide treatment and subsequent washing. Another de-inking process, the Maclaren-Snyder De-Inking Process, was scheduled, as the next paper, for presentation by Stanley Maclaren.

Dr. H. F. Lewis of the Institute of Paper Chemistry was next on the program with an illustrated presentation on "Changes in Fiber Structure During Cooking and Bleaching," a joint contribution by C. H. Carpenter and himself.

The last paper scheduled before the Wednesday afternoon session of the operating and research and development division was a joint contribution by J. N. McGovern and G. H. Chidester of the Forest Products Laboratory on the "Effect of Chip Length in Sulphite Pulping." In this paper it was stated that, in sulphite digestion of western hemlock heartwood chips varying in length from ⅛ of an inch to 1⅛ inches, the time of penetration increased in a parabolic manner with increasing chip length; and that optimum strength values were reached in pulps from chips ¼ to ½ inch long. Disregarding the ray cells, the fiber data showed a gradual decrease in shorter fibers and a corresponding increase in longer fibers in pulps from increasing lengths up to ½ inch; pulps from chips over ½ inch long having a more or less even distribution of fibers of different lengths. Similarly, various fiber length averages and medians increased in value with the

chip length and indicated a reduction in fiber length by chipping.

The first of the three papers before the Wednesday afternoon session of the operating division was a joint paper by Dr. Otto Kress and F. W. Brainerd of the Institute of Paper Chemistry on "A Study of Wood Pulp Fractionation." This paper covered the work of fractionating a series of chemical and mechanical pulps and testing the individual fractions for chemical constants and physical properties. Both chemical and physical properties were shown to have become poorer in successively shorter fractions of unbeaten chemical pulps; while the strength of mechanical pulps increased with decreasing fiber lengths, and only the finest (through 200-mesh) fraction approximated the strength of the original pulp.

The effect of beating on the fractional composition of four pulps was investigated and very different reactions to beating were noted. In the case of bleached pulp, at least, their ability to resist cutting seemed to be related to their purity.

G. Lamont Bidwell, Jr., of the Riegel Paper Corporation in his paper, "Beater and Jordan Control," the second paper scheduled before this group meeting, outlined means whereby instruments might be used to control the freeness, consistency, and other properties of pulp by mechanical regulation of beater rolls, and jordan plugs. Factors affecting freeness drop in beaters—qualities of pulp used, amount of broke in furnish, setting of the roll, consistency of stock, and chemicals used were individually discussed, and means for control suggested. In like manner, means for controlling amperage and consistency in jordan operation were also suggested.

The last paper scheduled before this group meeting was by Dr. Manson Sutherland, Jr., on "Notes on Continuous Refining." Mr. Sutherland pointed out that temperatures higher than normally experienced in batch refining were to be expected in continuous refining; that the refining actions now produced by the batch system could be obtained in one or more continuous machines synchronized in capacity with the paper machine; that continuous sizing, coloring, and loading systems must be further developed to work in conjunction with continuous refining; and that some progress was being made in the development of continuous refining.

The round table discussion, scheduled as the concluding part of this meeting, was headed by Mr. Sutherland and was designed to cover stuff preparation.

## Papers of the Fourth Day

Two divisional group meetings were held on the morning of February 22, the fourth and last day of the convention. One meeting was held by the engineering and management division with M. H. Teaze and W. M. Shoemaker presiding, and the other by the operating division and raw materials division with F. C. Clark and J. L. Parsons presiding.

The first paper scheduled before this meeting of the engineering and management division was presented by C. W. Rivise, Chairman, T.A.P.P.I. Patents Committee, on "Creating a Favorable Patent Situation." In this paper, Mr. Rivise predicted that research and development work will take on a new life, and that patent protection will assume greater importance than ever. He also suggested that a patent was both an offensive and defensive weapon and that it might be used as a counter in bargaining for rights under a patent belonging to a competitor. A patent policy, in the opinion of Mr. Rivise, should be continuous and co-extensive with the organization's industrial activities; and patent protection, considered as a branch of the business policy pursued by the executives of an organization should be augmented by the registration of trade names, trade-marks, labels, and prints. Mr. Rivise likewise advised a more progressive and liberal policy toward employee-inventors.

"Economic Aspect of Stoker Applications," by R. A. Foresman of Westinghouse Electric and Manufacturing Company, the second paper scheduled before the meeting, in brief, presented an analysis of the influence of stoker design on capital expenditures for the generation of power. To determine the kind, size and type of boiler unit, said Mr. Foresman, the area of the stoker should first be determined. Then the boiler should be selected, and this selection followed by the selection of the remainder of the elements and the assembly of the unit completed. Some material of a general character was presented on the subject of underfeed stokers as a whole, but considerable emphasis was placed upon a description of the five types of underfeed stokers manufactured by Westinghouse with special emphasis upon their new type of multiple retort unit.

W. P. Gavit of United Engineers and Constructors, Inc., was scheduled for the last paper before this group meeting. In his paper on "Steam and Power in the Pulp and Paper Industry," were outlined some ways for increasing the economy of production and utilization of steam and power within the industry. It was said that the total direct cost of steam and power in a sulphate or soda mill which often exceeded $10.00 per ton might be reduced to something like $5.00 per ton by taking advantage of methods and systems now available. The majority of paper mills were said to be operating on steam pressures of less than 200 pounds per square inch and that in such cases an opportunity was offered for large savings in the cost of power and steam by superimposing upon the existing system a high pressure boiler with either a high back pressure or extraction type turbine. Considerations involved in adding such a high pressure system were also amplified and suggestions made for the profitable utilization of waste sulphite liquor.

Among the papers presented before the meeting of the operating division and raw materials division was one by W. R. Willets of the Titanium Pigment Company in "Beater Addition of Titanium Pigments." In this paper, Mr. Willets discussed the general theory of opacity and brightness of paper with special reference to the titanium pigments; showed the use effect of titanium pigments in unwaxed and waxed papers as compared with common paper fillers; reviewed factors affecting retention of fillers in paper, and gave data on the retention of titanium pigments. In speaking of retention, he said, not only should a pigment for use as a beater addition produce the desired properties of opacity, brightness and whiteness, but such a pigment should likewise be retained satisfactorily by the paper stock. Among the factors that he mentioned as affecting retention were: long fibered pulps retain fillers better than short fibered pulps; beating with resultant hydration and formation of a fine network of fibrillae increases retention; retention is decreased with increasing solubility of the filler; for any given filler there is a point of the filler-fiber ratio at which retention reaches a maximum; use of rosin size, or silicate of soda, precipitated by alum results in increased retention; and various machine variables, such as increasing dilution of stock on machine wire, increased machine speeds, increased shake, increased suction, and decreased sheet weight tended to decrease retention.

Mr. Willets also stated that titanium pigments in actual mill practice gave average retention figures of 70 per cent, 80 per cent not being unusual, and even 90 per cent being reported by certain mills having very efficient white water systems.

Another paper on the subject of pigments was presented by V. A. Belcher of the New Jersey Zinc Company. It was entitled, "Zinc Pigments in Today's Paper Industry," and covered the use of zinc sulphide pigments in the production of lighter opaque sheets for mailing, in waxing paper for food wraps, in boxboard, in absorbent paper, in fruit wraps, and in paper pie plates. Figures were given showing the advantages derived from the use of zinc sulphide pigments in paper used for mailing purposes, and the other interesting uses, previously mentioned, amplified. It was also explained that zinc sulphide pigments did not necessarily have to be added in the beater; they could be introduced, if desired, as a slurry at the head of the machine. In addition, the use of zinc sulphide for coatings was briefly touched upon.

Following the presentation of these two papers on pigments, Dr. Parsons, as Chairman of T.A.P.P.I. special color committee, reported on "Color Standards and Methods of Evaluation." He reviewed the history of the plaster of Paris color wheel which was never accepted as a color standard as it had proven itself to be rather inadequate. The subject of color, however, had assumed such importance, said Dr. Parsons, that the color committee had been

formed. Now it was their desire to determine the color requirements of the industry in the way of color nomenclature and color specifications.

Paul Rea of the National Lead Company, following the remarks of Dr. Parsons, presented some most interesting fundamental facts on color. His talk was cleverly illustrated with charts and models, and was designed to show how the standardization of pulp and paper colors might be accomplished.

The remainder of the session was given over to remarks by H. W. Morgan of the New York State College of Forestry, who stressed the color of pulp as well as means of measuring it; by B. W. Scribner of the Bureau of Standards, who expressed an increased demand for paper color standards; by Edwin Sutermeister, of the S. D. Warren Company, who suggested that there were color problems with non-fibrous materials that were urgently in need of study; by K. A. Taylor of the Oxford Paper Co., who set up a list of qualifications desired in an instrument used for measuring color; and by others who were fundamentally interested in this important subject.

## Annual T.A.P.P.I. Luncheon

The annual Technical Association luncheon, held from 1 to 3 p. m. on Thursday, February 22, in the Grand Ball Room of the Waldorf-Astoria Hotel, proved a real "grand finale" for the convention. The entire ball room was crowded. In fact, it was not only the best attended luncheon that the Association had ever held, but counted among those who feasted were dignitaries of the American Paper and Pulp Association, American Pulp and Paper Mill Superintendents Association and other associations of the industry, as well as representatives of the Federal Government.

The first speaker on the luncheon program was "Oscar," world famous chef of the Waldorf-Astoria, who spoke a few sincere words of welcome. Then Allen Abrams, putting on what appeared to be a five-gallon sombrero—at least a very large cowboy hat that had been given to him by the Pacific Coast Section of T.A.P.P.I. at the time of his visit to the West Coast last year—commented briefly on the 1934 fall meeting at Portland, Oregon. G. S. Brazeau of the Weyerhaeuser Timber Co., and Chairman of the Transportation Committee for the Portland convention, was then called upon to explain plans for the meeting. In making his remarks, Mr. Brazeau invited, in addition to T.A.P.P.I. members, all those interested in pulp and paper manufacturing or its allied interests to attend. A few remarks were also made by Dr. Charles Herty, a research leader who has been so much in the limelight within recent months because of his activities at Savannah, Ga.

### Election of Officers

At this point in the program, the election of officers was held and by a unanimous vote the following were elected for the ensuing year: President, Clark C. Heritage, Oxford Paper Co., Rumford, Me.; Vice President, Grellet Collins, International Paper Co., New York City; Secretary, R. G. Macdonald, 122 East 42d Street, New York City.

Miss Helen U. Kieley, American Writing Paper Co., Holyoke, Mass., and H. R. Murdock, of the Champion Fibre Co., Canton, N. C., were also elected as members of the executive committee.

Following the election of officers, Mr. Heritage expressed appreciation for the honor that the Association had bestowed upon him, told of the growth of T.A.P.P.I. during the years, urged every one to go to the Portland convention so that the Pacific Coast Section might not only know but feel that it was an integral part of the Association, and expressed the desire that committee activity in respect to the matter of paper quality be expanded. R. S. Kellogg, Secretary of the Newsprint Service Bureau, from the floor moved that the Association go on record expressing its appreciation for the service rendered by its retiring president, Allen Abrams. This move was not only seconded, but by a rising vote showed Mr. Abrams that his efforts had not been in vain.

### Deputy Administrator Pickard Is Guest Speaker

In a few brief words, Mr. Abrams then introduced W. W. Pickard, Deputy Administrator, Paper Division, National Recovery Administration, Washington, D. C., as the principal speaker on the luncheon program. Mr. Pickard's subject covered the nature and purpose of the N. R. A. He said that the N. R. A. was necessary because industry had been driven into a state of anarchy, that everybody was thinking only of self, and that no one thought in terms of industry. The tendency to reduce costs by forcing down wages, said Mr. Pickard, not only reduced purchasing power, but in turn, orders.

On March 4, 1933, American industries were said to be staggering, people were out of work and starving, and then came a new leader and a new deal. Industry, continued Mr. Pickard, has emerged from anarchy, has established its own government, and now has been given authority to deal with the problems which it created subject, of course, to the supervision of the Federal Government for the protection of the general public.

Mr. Pickard called attention to the conference of leaders of all industries scheduled for the week beginning March 5 in Washington, just one year following President Roosevelt's inauguration into office. At this conference, it was suggested, wages and working hours would be one of the most important subjects for discussion, since the forty-hour week, which has generally been adopted, now seems too long.

Mr. Pickard further emphasized the fact that the N. R. A. program was yet in its infancy; that the code should be kept simple and understandable; and that the N. R. A. in some form was here to stay. He mentioned the work of statistics gathering; the dissemination of statistics so acquired; the prevention of unfair trade practices; and the legalization of open price stabilization.

The problem of overproductive capacity was said to be very important, and without a panacea to offer, he cited the plan of a number of board manufacturers who have entered into an agreement to form a corporation and to tax themselves on a basis of tonnage production to supply capital to acquire marginal mills and to shut them down. The agreement provides that the Administrator may at any time at his discretion require that any such unit be thrown back into production and that his approval of the whole plan may be withdrawn, if it should appear to be injuring the public. The theory upon which this plan is based was said to be that efficient mills operating at full capacity would have reductions in cost that could be passed on to the consumer.

He further cited the experiment in newsprint in which the Canadian manufacturers have made an agreement with American manufacturers that if the Americans will fix the price of newsprint and obtain the approval of the President of the price so fixed, that they, the Canadians, will conform to that price. This plan, he said, was opposed and the outcome uncertain.

In concluding his remarks, Mr. Pickard stated that the old undercurrent of suspicion and hostility in the paper industry were losing force, and that the continual association of the past few months have given men knowledge of each other and a tolerance of each other's views, the real foundation of industrial government.

With the completion of Mr. Pickard's address, the 19th Annual Convention of the Technical Association of the Pulp and Paper Industry became history, but those privileged to attend as one of the most successful conventions ever held by the Association.

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## ◆ University of Maine Paper Men Meet

Twenty-four members of the Alumni of the University of Maine, who were present at the annual meeting of the Technical Association of the Pulp and Paper Industry met on Tuesday evening, February 20, 1934, at the Hotel Lexington in New York City.

C. H. Champion of the R. T. Vanderbilt, president of the group, presided as chairman of the meeting and led a discussion regarding the position that the University of Maine should have in the paper industry. As a result of this discussion a committee consisting of A. W. Nickerson and F. E. Donavan of the Robert Gair Company; C. H. Champion, Louis Schweitzer and A. B. Norcross of the International Paper Company were appointed to study the relation of the University of Maine to the Paper and Pulp Industry.

# American Paper and Pulp Ass'n Holds Annual Meeting

THE fifty-seventh annual convention of the American Paper and Pulp Association and affiliated organizations was held in the Waldorf-Astoria Hotel, New York, on February 19-23, inclusive. The five-day gathering of paper manufacturers from many sections of the United States was featured by the large number of group sessions of the various divisions of the parent Association and other organizations. The attendance at this year's convention was fully up to normal, and notwithstanding the seriousness and importance of the matters considered, more especially in connection with the codification of the industry, an atmosphere of enthusiasm and jollity pervaded the convention halls—unquestionably a reflection of the optimism of the paper manufacturers of the country.

The convention this year differed from its predecessors in that there was no general open or business session of the A.P & P.A., and contrary to long-established custom and perhaps an interesting sidelight on the changing times in association functioning, there was no banquet or super-luncheon on the convention program. The spectacular annual banquets of other years gave way entirely to business sessions under the group or divisional headings.

This being the first yearly gathering of paper manufacturers since the industry has become codified, the code and operations thereunder constituted the principal subject of discussion and consideration at the numerous meetings convened during the five-day period. Hours, wages, labor regulations, price minimums, paper quality gradings, trade practices and other matters appertaining to and a part of the code were accorded due consideration, and in nearly all of the addresses made at the convention the code was the theme elaborated upon or made the prime subject of the talks.

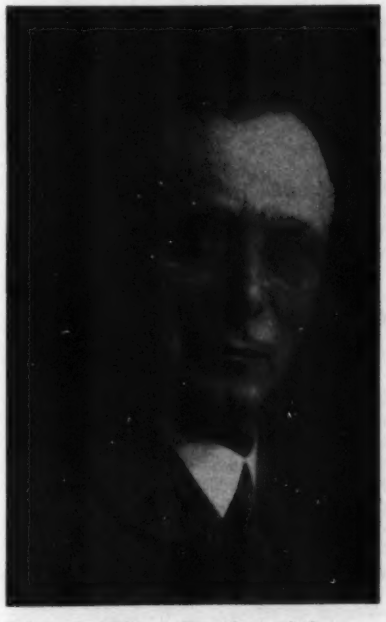
The annual election of officers of the American Paper and Pulp Association took place at a meeting of the Board of Governors of the Association on the evening of February 22 in the Waldorf-Astoria, and resulted in the re-election of Sidney L. Willson, president of the American Writing Paper Company, Inc., Holyoke, Mass., and president of the Paper Industry Authority, as president of the Association for another year. This will be Mr. Willson's fifth consecutive term as head of the A.P. & P.A.

Vice presidents elected follow: George H. Mead, The Mead Corporation; Hugh J. Chisholm, Oxford Paper Company; Stuart B. Copeland, Eastern Manufacturing Company; H. W. Ellerson, Albemarle Paper Manufacturing Company; D. Clark Everest, Marathon Paper Mills Company; A. R. Graustein, International Paper Company; F. J. Sensenbrenner, Kimberly-Clark Corporation; Norman W. Wilson, Hammermill Paper Company; J. D. Zellerbach, Crown-Zellerbach Corporation, and John L. Riegel, Riegel Paper Corporation.

**President Willson's Address**

Speaking at the meeting of the Board of Governors of the A.P. & P. A., President Willson stated that he was greatly impressed with the changes that have taken place in business conditions, in mental attitudes and in ideas of cooperation.

"A year ago the Association was disintegrating," he said. "It seemed almost an impossibility to keep it in existence, and yet it was realized that even



**Sidney L. Willson, President of the American Paper and Pulp Association and Chairman of the Paper Industry Code Authority**

if it ceased to exist, six months would not elapse before another organization would be created, for our industry cannot be without a central association. The distress in which industry found itself was the seed that later took root and became a sturdy oak with its branches developing through proper cultivation.

"I want to make a resumé of activities during the past year and a half. I should say the first signs of regeneration took place when a meeting of the Book Paper Manufacturers occurred at a get-together meeting in Spring Grove, Pa. This meeting was called for the purpose of having the manufacturers become acquainted with each other. From those contacts there developed friendships and confidences, the result of which was, at a subsequent similar meeting, an exchange of ideas pertaining to the disastrous competitive conditions existing within that group, which conditions were paralleled in other groups. Finally an organization was effected. What it has accomplished for its own group is well known. It became a model for other divisions and has been a bulwark of strength in building and supporting our present organization.

"Shortly thereafter the Kraft Paper Manufacturers Association was reorganized; the Sulphite Papers Division was strengthened, and in rapid succession other groups formed cooperative agencies. These, together with the Writing Paper Manufacturers Association, which had maintained its activities continuously throughout the depression, gave a new impetus to the industry's central organization which resulted in the rebirth of the American Paper and Pulp Association.

"When the National Industrial Recovery Act was pending in Congress, it became apparent that for an industry to properly function under its provisions, it must do so through an association representing a large majority of those connected with the industry. To say that I was pleased with such a condition is to express it mildly. It was the goal for which I had long hoped. In August a general meeting was called by the American Paper and Pulp Association for the purpose of discussing reorganization and executives from many branches of the industry attended. It was the unanimous opinion that the reorganization should be predicated upon a federation of divisions and resolutions were passed to that effect, with authority to the American Paper and Pulp Association to prepare Constitution and By-Laws upon that idea. Shortly thereafter, another meeting was called at which the new Constitution and By-Laws were submitted and approved, and the reorganization effected through the election of officers, and the creation of a Board of Governors. The members of the industry have reason for satisfaction in the selection by the Board of Governors and in securing acceptance as members of the Executive Committee the type of men who now compose it. The industry is indeed fortunate to have a group of men who not only represent the whole gamut of products, but who do so upon an equitable geographical basis. This Executive Committee under the General Code of Fair Competition was selected as the agency for ad-

ministering the provisions of the code and was designated at 'The Paper Industry Authority.'

"In order to eliminate confusion or complication in its activities as an administrative agency only and apart from the activities of the Executive Committee of the American Paper and Pulp Association, the Paper Industry Authority prepared and approved its own Constitution and By-Laws by which it is now governed.

"As chairman of the Paper Industry Authority, I want to say to the Board of Governors that you made no mistake in the selection of the men composing it. It is a pleasure to sit in the meetings and know that every statement, every argument and every act has back of it the thought of 'How can we help the paper industry?'—and free from selfish company motives.

"Between August and the time of the approval of the general code many meetings were held, protracted meetings, some lasting past midnight, with a full attendance at most of them, and with many of the members neglecting their own business for the benefit of the entire industry. I am making these statements because I want every one present to realize that the provisions of the code are taken seriously and further because I want to impress you with the necessity of having your cooperation in seeing that its provisions are lived up to. There is a responsibility upon all of us, particularly as officers and members of the Association. Our influence should also be used to sell the benefits of the code to each member of our respective companies and to the officers and members of those companies belonging to your group. You should go even further—sell your salesmen and get them to sell its benefits to those to whom they sell. One of our troubles in life is a lack of understanding. I don't mean a lack of intellect, but a lack of knowledge of conditions, of benefits, of methods and means, and of other factors that will clarify the situation. I want again to urge each one of you to study the code religiously as a parson studies his Bible.

"The code in its final form came up for hearing September 14th and was finally approved and became law on November 27th. To immediately have it operative became a momentous task, and it is easily seen why misinterpretations might develop because in the hurried formation of the code many conditions were overlooked—which again is a case of lack of understanding. When the code was finally approved, the Paper Industry Authority immediately started to make it effective. The following committees were appointed to handle certain phases of the necessary work: Finance, Statistics and Cost, Labor, Production and Classification, Trade Customs and Fair Trade Practices, Compliance, Marketing, Pulpwood and Conservation, Tariff.

"I shall not attempt to go into further details but I want to say a few words about the general results thus far obtained through the provisions of the code. It must be remembered that less than three months have elapsed since it became effective.

It has practically eliminated cutthroat competition.

It has served to stabilize prices.

It has increased the numbers employed.

It has increased purchasing power.

It has developed co-operation.

It has developed horse-sense.

It has made people think.

It has developed confidence.

It has placed our industry on a higher plane.

It has created a knowledge of the fact that the success of any one division is dependent upon the success of the entire industry.

"I forecast a bright future for our industry. I am unable to conceive of any level-headed business man throwing away the opportunity to protect his own business through failure to give complete co-operation with the code authorities. If this is done, it means success—if it is not done—well, I am not going to harbor any such thoughts. It has to go in spite of the ax and the chisel."

The first day of the convention was given over largely to a joint meeting, with forenoon and afternoon sessions, of the American Paper and Pulp Association and the Technical Association of the Pulp and Paper Industry for a symposium on paper classification and standards. An account of this conference which was held in the Astor Gallery of the Waldorf-Astoria, is included in the report of the meetings of the Technical Association, published elsewhere in this issue.

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## ◆ National Paper Trade Association

The National Paper Trade Association, whose membership comprises the leading paper jobbers and merchants of the country, held its thirty-first annual convention simultaneously with the A. P. & P. A. and the T.A.P.P.I. at the Waldorf-Astoria Hotel in New York, on February 19 to 21, inclusive. The meetings of the various divisions of the merchants' association were well attended.

At the annual business session and election of officers, A. W. Leslie, of the John Leslie Paper Company, Minneapolis, Minn., was elected president for the ensuing year, succeeding Sidney L. Wellhouse, of the National Paper Company, Atlanta, Ga. Mr. Leslie previously had been the Association's vice president in charge of the Fine Paper Division. Other officers chosen follow:

Vice president, in charge of the Wrapping Paper Division—H. L. Zellerbach, Zellerbach Paper Company, San Francisco.

Vice president, in charge of the Fine Paper Division—Oswald F. Marquardt, Marquardt & Co., New York City.

Treasurer—Charles Addoms, Miller & Wright Paper Company, New York City, re-elected for his eighth consecutive term.

Executive Secretary—Arthur H. Chamberlain, 420 Lexington Ave., New York.

In addition to reports, addresses were made at the annual meeting by Ex-Governor Sweet, of Oklahoma; President Wellhouse, and Executive Secretary Chamberlain. Deputy Administrator Arthur D. Whiteside of the NRA was unable to be present to fulfill his speaking engagement.

Ex-Governor Sweet gave an interpretation of the NRA, emphasizing the necessity of self government, particularly as applied to an industry contained within itself.

President Wellhouse reviewed the many and important events of the past year, and devoted a large portion of his address to the code and the operation of the paper merchandising trade under codification.

## ◆ Paper Mill Supplies Institute

The first annual convention of the American Paper Mill Supplies, Inc., was held at the Commodore Hotel, New York, on February 19 and 20, during Paper Week in the Metropolis. This organization, composed of prominent merchants dealing in paper manufacturers' supplies, devoted two days to discussing code matters and other subjects of prime importance to the paper stock trade, and electing officers and code authority representatives.

Samuel I. Hershman, of I. Hershman & Co., Inc., New Haven, Conn., was re-elected president for the ensuing year, and the following vice presidents were elected: Lisle Q. Owens, Baltimore, Md.; Robert F. Graham and D. DeStefano, Boston, Mass.; Walter H. Martens and Charles Passannante, New York City; Andy C. Costarino, Brooklyn, N. Y.; Samuel Levine, Detroit, Mich.; Harry M. Bailey, Philadelphia; Anthony F. Carlo, Newark, N. J.; Maurice Pushker, Chicago; G. H. Einhauser, Pittsburgh, Pa., and David Greenberg, Hartford, Conn.

Ralph O. Williams, of New York, was elected treasurer, and Thomas W. Lydon, of Baltimore, Md., secretary.

The annual banquet of the Institute was given on the evening of February 20 in the Commodore, at which the speakers were Assistant District Attorney of New York County James Garrett Wallace, Supreme Court Justice Ernest E. L. Hammer, of New York City, President Hershman of the Institute, and Stanley Osserman, counsel for the Institute.

## ◆ Organized Research

If properly directed and controlled, according to a late report of the Policyholders Service Bureau, Metropolitan Life Insurance Company, research is recognized as a sound investment for an industrial organization.

This report is entitled *The Control of Industrial Research*, and contains data contributed by 45 prominent manufacturing organizations. This material deals with the organization and administration of an industrial research department.

# Affiliated Groups Meet and Elect Officers

At the annual meeting of the **Writing Paper Manufacturers Association,** Harrison R. Baldwin, of the Hammermill Paper Company, Erie, Pa., was re-elected president, and John L. Bagg, of the Millers Falls Paper Company, and chairman of the Rag-Content Division of the Association, was again elected vice president. F. Henry Savage, manager of the book and bond division of the International Paper Company, was elected vice president and chairman of the Sulphite Bond Division. The Executive Committee and Executive Authority elected is comprised of Vice Presidents Bagg and Savage; H. H. Howard, Aetna Paper Company; Horace A. Moses, Strathmore Paper Company; W. C. Wing, Fox River Paper Company; Donald W. Weston, Byron Weston Paper Company; D. K. Brown, Neenah Paper Company; W. M. Crane, Jr., Crane & Co., Inc., and William McClellan, P. H. Glatfelter Company.

**Cover Paper Manufacturers**

R. S. Madden, of the American Writing Paper Company, Holyoke, Mass., was re-elected president of the Cover Paper Manufacturers' Association, and the following were chosen to compose the Executive Committee: President Madden; J. B. Shepherd, Peninsular Paper Company; Guy Beckett, Beckett Paper Company; A. Ellis Frampton, Hammermill Paper Company, and John Van Horn.

**Tissue Mfrs. and Converters**

Under the direction of Leslie G. Wood, of the Northern Paper Mills, Green Bay, Wis., various trade practices affecting competition within the three zones of the organization were discussed at the meeting of the Manufacturers and Converters of Tissue. The problem of "zone differentials" occupied the greater part of the meeting. Mr. Wood was elected president of the Association, and Edward T. Jones, of the Stevens & Thompson Paper Company, Greenwich, N. Y., was elected vice president for the ensuing year.

**Kraft Paper Ass'n**

The Kraft Paper Association held an all-day meeting, and re-elected H. W. Ellerson, of the Albemarle Paper Mfg. Company, Richmond, Va., president, and John R. Miller, of the West Virginia Pulp and Paper Company, vice president. The Executive Committee elected is composed of W. H. Anders, Nashua River Paper Company; Norman Brown, Brown Company; A. C. Goodyear, Bogalusa Paper Company; J. N. Harvey, Advance Bag & Paper Company; L. C. Anderson, Sorg Paper Company; R. J. Cullen, Southern Kraft Corporation; R. A. McDonald, Crown-Willamette Paper Company; N. S. Stone, Mosinee Paper Mills Company; K. E. Stansbury, Thilmany Pulp & Paper Company, and J. L. Stille, Taggart Corporation. The only change in the Executive Committee was the election of Mr. Stansbury whose name was substituted for that of another member of his firm.

**Ground Wood Paper Ass'n**

At the annual meeting of the Ground Wood Paper Association, C. R. McMillen, of the St. Regis Paper Company, was re-elected president; L. L. Alsted, of the Combined Locks Paper Company, was again chosen vice president in charge of the Western Division, and K. S. Malachlan, of Fraser Paper, Ltd., was elected to the new post of vice president in charge of the Eastern Division.

**Waterproof Paper Mfrs.**

At the annual meeting of the Waterproof Paper Manufacturers Association the following officers were elected for the ensuing year: President, Fred P. Wood, of the Simplex Paper Corporation, Adrian, Mich.; vice president, F. E. Rothermel, of the Crepe-Kraft Company, Newark, N. J.; Executive Committee, Messrs. Wood and Rothermel; E. H. Angier, Angier Corporation, Framingham, Mass.; W. W. Rowe, Paper Service Company, Lockland, Ohio, and J. D. Young, Edgewater Paper Company, Menasha, Wis.

**American Waxed Paper Association**

W. J. Eisner, of the Newark Paraffine & Parchment Paper Company, Newark, N. J., was again chosen president of the American Waxed Paper Association, and V. E. Nunez, of the Nashua Gummed and Coated Paper Company, and Leo Croy, of the Menasha Products Company, were re-elected vice presidents. This year the Association will be served with an Executive Committee, consisting of the foregoing officers and Walker Hamilton, Riegel Paper Corporation; L. O. Turner, Detroit Wax Paper Company; H. O. Nichols, Western Waxed Paper Company; Leslie Jacobs, Pollock Paper & Box Company; R. B. Donnelley, Central Waxed Paper Company; Homer Sinclair, American Tissue Mills, and V. H. Wilshire, Specialty Papers Company.

**Cardboard Mfrs. Ass'n**

The Cardboard Manufacturers Association re-elected its group of officers for another year's term. H. W. Karmer, of the A. M. Collins Manufacturing Company, Philadelphia, was named president; J. A. Moser, of the Falulah Paper Company, vice president; H. W. Sutter, of the Champion Coated Paper Company, treasurer, and Kendall Wyman, also of the Champion Coated Paper Company, secretary.

**Sulphite Paper Mfrs.**

The annual election of officers of the Sulphite Paper Manufacturers Association resulted in a reduction of the Board of Governors from 14 to 9 members. E. W. Kiefer, of the Port Huron Sulphite & Paper Company, was elected vice chairman of the M. G. Sulphite Division; Thomas A. Hendry, of Fraser Industries, Ltd., vice chairman of the Bleached Paper Division; George Stuhr, of the Continental Paper and Bag Corporation, vice chairman of the Unbleached Division, and W. B. Merlin, of the Hollingsworth & Whitney Company, vice chairman of the Manila Division. The general chairman is Paul S. Fiske, of the Parker-Young Company, who was re-elected. Thomas J. Burke continues as secretary-treasurer.

**Glassine and Greaseproof Mfrs.**

At the business meeting and election of officers of the Glassine and Greaseproof Manufacturers Association, Carl Stansbury, of the Thilmany Pulp & Paper Company, was added to the Association's Executive Committee. Other members were re-elected. Robert F. Nelson, of the Glassine Paper Company, is chairman of the Committee, and Folke Becker, of the Rhinelander Paper Company, and John L. Riegel, of the Riegel Paper Corporation, are members.

**Paper Makers' Advertising Club**

Edson Dunbar, of the Crocker-McElwain Company, Holyoke, Mass., was re-elected president of the Paper Makers' Advertising Club at the annual meeting of that group in the Carpenter Suite of the Waldorf-Astoria. William S. Fowler, Hampden Glazed Paper & Card Company, was again named vice president, and Orin R. Summerville, Beckett Paper Company, was re-elected treasurer. Richard Linsert, of the American Writing Paper Company, was elected secretary to succeed Sam Pace, of the Strathmore Paper Company, who resigned owing to the removal of his business activities to Chicago. The International Paper Company, it was announced, was elected to membership. Annual reports of officers featured the session; also data in connection with the publication of the Association's quarterly, "Direct Advertising."

**Newsprint Manufacturers**

The Association of Newsprint Manufacturers of the United States elected the following officers at its annual meeting: Edgar Pickard, of the Pejepscot Paper Company, Brunswick, Me., chairman; A. H. Hobson, of the St.

Croix Paper Company, and C. K. Blandin, of the Blandin Paper Company, vice chairman. The Advisory Committee elected is composed of the foregoing officers and William A. Whitcomb, Great Northern Paper Company; I. Zellerbach, Crown-Zellerbach Paper Company; R. H. M. Robinson, Minnesota and Ontario Paper Company, and Archibald R. Graustein, International Paper Company.

**Book Paper Mfrs. Ass'n**

At the annual meeting of the Book Paper Manufacturers Association the following officers and Executive Committee were elected: George H. Mead, The Mead Corporation, chairman; P. H. Glatfelter, P. H. Glatfelter Company, treasurer, and J. L. Fearing, R. D. Smith, C. A. Gordon, J. N. Bergstrom, L. G. Thomson, J. R. Miller, W. T. Schmitt, J. S. Sensenbrenner and G. K. Ferguson.

**Bristol Board Mfrs.**

Norman Harrower, of Linton Bros., Fitchburg, Mass., was elected chairman of the Bristol Board Manufacturers Association, and Edward Bailey, of Hollingsworth & Whitney Company, Boston, Mass., was chosen vice chairman. The following Board of Directors was elected: M. S. Flint, Brown Company; Joseph E. Holmes, Chemical Paper Manufacturing Company; S. Dillingham, West Virginia Pulp & Paper Company, and W. B. Darling, Munising Paper Company.

# Annual Meeting and Luncheon of Salesmen's Association

THE annual meeting of the Salesmen's Association of the Paper Industry was held Tuesday, February 20, in the Romany Suite of the Waldorf-Astoria Hotel, New York, with President Harold R. Knott, of the Eastern Manufacturing Company, presiding. Mr. Knott guided the business session to a fairly rapid termination. At the election of officers for the ensuing year, William L. Raymond, of the P. H. Glatfelter Company, was chosen president to succeed Mr. Knott, who served three terms; Melvin F. Pray, of the Brown Company, was elected vice president in charge of the eastern division, and R. C. Johnson, of the Northwest Paper Company, vice president in charge of the western division.

A motion to amend the by-laws to provide for a reduction in the annual dues of membership in the Association from $25 to $10 was carried unanimously, this action being permitted by the excellent condition of the organization's treasury. The vice presidents of the past year reported on the activities of their respective divisions during the year, Mr. Raymond reporting for the eastern section, and Creighton Whiting, of the American Writing Paper Company, for the western division.

In his annual address at the meeting, President Knott reviewed the events of the past year and commented on the marked improvement made by the paper industry through co-operative effort. He urged strict adherence of salesmen to the provisions of the code for the industry, and stressed the necessity of paper salesmen in the paper industry for carrying on operations under the code.

"The salesman of today, contrary to the feeling of some executives, is more important than ever to his company," he said. "Selling under the NRA is going to give the salesman a chance to sell, not to quote prices and be told his price is out of line, as was the case many times in the not too far distant past. If you expect to continue as a salesman with your company under today's conditions, you have got to apply and fortify yourself with fundamentals, and know as do the majority now that the New Deal does not make it any less essential that you exert yourself to the utmost to corral business. Don't let anyone convince you that there is no sentiment in business. To the contrary, there is sentiment in business and, everything else being equal, individualism will lead the way to business which price may have kept you out of under the old deal.

"The salesman of the future who knows his product and his customers' requirements from all angles and the code stipulations pertaining to same so that he can present his product intelligently, is going to get business, provided he is sincere in his desire and ability to serve both his customer and his mill. You must have confidence in the ability and intentions of the code authorities to properly classify and control grade differences. Don't be misled by the claim of a customer that he can buy a better grade at the next lower grade price. Get full samples and information in such instances and report fully to your executive, who will investigate through the proper source. This is one of the pet tricks of the chiseler and must be broken down.

"The question of policing may become a simple matter or a very much involved matter in any industry, but with the setup to the Salesmen's Association of the Paper Industry now in its sixteenth year of operation, reaching into every division of the industry and covering the United States, the problem becomes more one of enforcement through education and application than policing. The man in the field, or, in other words, the salesman, is the man who is usually first to hear of any violations, and therefore any further investigation or action should logically start with him. The salesmen of our industry are charged with a very serious duty. Upon them more than any other group or individuals depends to a large extent how smoothly future operations under the code proceed.

"There is no place in the present setup for the Calamity Jane and pessimist. Go about your selling with dignity, radiating optimism and cheerfulness, and watch the catching effects on those you talk with."

The annual luncheon of the Salesmen's Association in the Roof Garden of the Waldorf-Astoria, following the annual meeting of the Association, was, in the parlance of the press-agent, a complete "sell-out." Upwards of 400 were present, and the spacious dining hall was crowded. Speakers at the luncheon were President Sidney L. Willson, of the American Paper and Pulp Association; George H. Mead, head of the Mead Corporation, and James E. Gheen. They were introduced by retiring President Knott, who acted as toastmaster. Deputy NRA Administrator W. W. Pickard, who was a guest, also was called upon by Mr. Knott, and made a few remarks.

President Willson called upon the salesmen to acquaint themselves with the industry's code and asked for their hearty co-operation in behalf of the A. P. & P. A. He congratulated the members of the Salesmen's Association, and spoke a few words of encouragement and guidance.

Mr. Mead drew a wonderfully clear picture of the present set-up under the National Recovery Act, and ventured the prediction that the country, and more especially the paper trade, is headed for a period of sound and straightforward prosperity.

"We hear people at all times complaining about interference by the government," said Mr. Mead. "After all, gentlemen, it is your government and my government. It is time the industrial men of the country, which is an industrial country, should be willing to give some of their time and thought to the government which must succeed unless our civilization is to fail."

The paper industry must maintain its position today and work to move forward, thereby justifying all the painstaking endeavors that have gone into building its foundations. The members of the Salesmen's Association, he said are on the firing line, and to them the trade is looking to "Go Forward."

Mr. Gheen, a professional orator, gave an interesting talk in which the theme of co-operation was the keynote.

The Association committee having charge of arrangements for the annual luncheon consisted of Melvin F. Pray, chairman; Alan B. Helffrich, W. H. McGoldrick, J. L. Fearing and J. K. Hutchinson, Jr.

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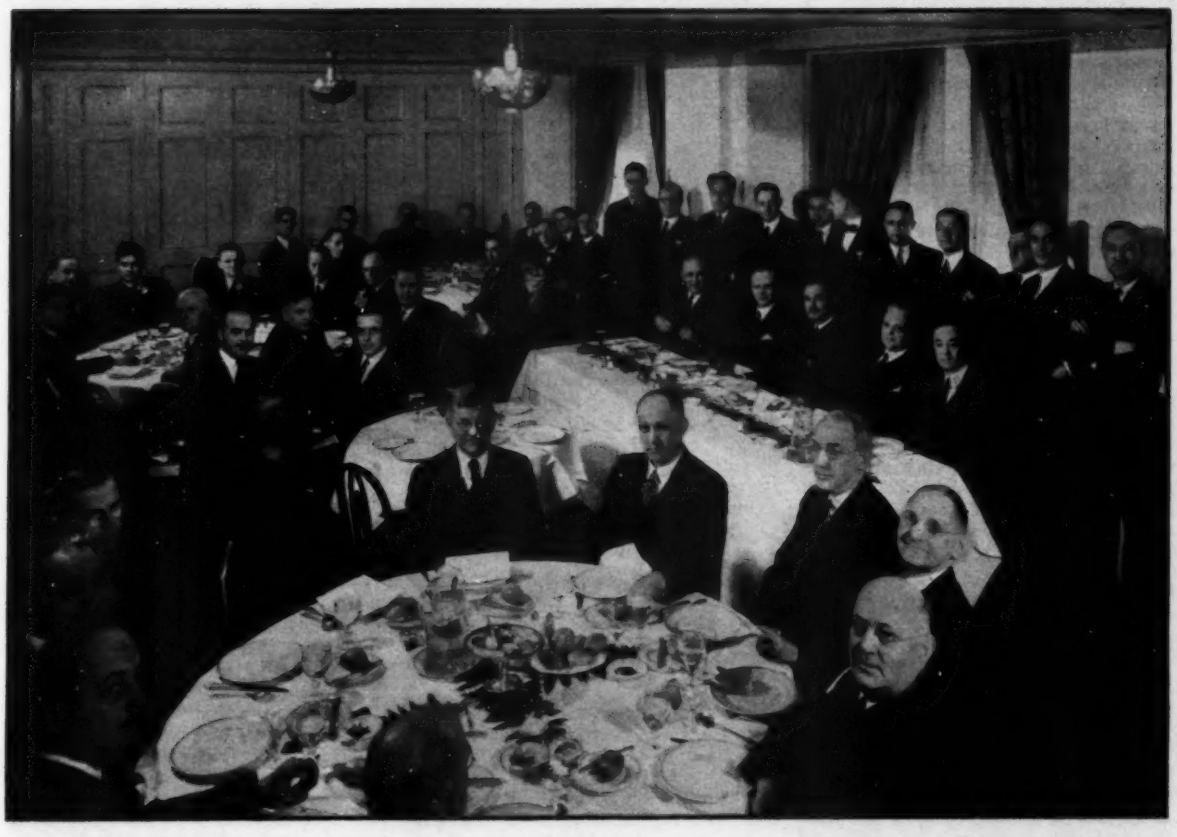
◆ ACCORDING to *The Paper Maker and British Paper Trade Journal*, the Government of Turkey has recently outlined an extensive industrial program to make Turkey largely independent of imports of manufactured goods. Papermaking is one of the new industries to be introduced as the plan provides for the establishment of a paper mill, later a pulp mill.

# Luncheon Meeting of Machinery and Equipment Manufacturers



A FEATURE of the convention was the luncheon meeting of the National Association of Manufacturers of Paper and Pulp Machinery and Equipment, held on February 21, and at which President Sidney L. Willson, of the A. P. & P. A., and H. C. Beaver, president of the Worthington Pump and Machinery Company and vice president of the Machinery and Allied Products Institute, were speakers. Phillips Dennett, of the Bird Machine Company, South Walpole, Mass., president of the machinery association, presided, and introduced the speakers.

Mr. Willson went into considerable detail in recounting conditions and events leading up to the NRA, as well as the purposes of the New Deal instituted by President Roosevelt. He also cited statistics relative to machinery and other productive equipment in the paper mills of the country, as well as figures regarding paper production, which, he asserted, justified the proposal of the Paper Industry Authority to restrict the installation of new or additional equipment in the paper manufacturing industry.

"Because of its wide variety of products and their essential character in modern life, the pulp and paper industry possesses the attributes of stability common to the essential industries, such as the food and clothing industries," he stated. "In point of production and consumption it is stable. It should be as stable financially.

"Between 1929 and 1932, the low point in the production trend, paper manufacture decreased only 26 per cent, a wholly insignificant decrease compared with the declines in such industries as steel, lumber, cement, automobiles and many others of equal importance. But the industry was unable to profit by its opportunities for stability; the unbalanced relation of production to capacity created a condition that overshadowed all chance for stability with the result that paper prices sank dangerously below costs. At the beginning of 1933 the paper industry was operating on the verge of insolvency."

Since the national recovery program was started, and under its influence, the volume of paper consumption has increased and paper prices have responded, Mr. Willson said. He stated that production was over-stimulated, however, by the fear of more rapidly rising prices, and the levels established last summer could not be maintained and meantime the industry has again receded to subnormal and wholly uneconomic levels of productive operation. Therefore, the industry is not in an enviable financial position, and needs time as well as protection to enable it to recoup the resources required in the maintenance of its personnel and production facilities. It has, therefore, undertaken a broad program of reconstruction, including a control of productive capacity.

Briefly, the measures proposed, Mr. Willson said, seek to prevent any immediate increase in the idle capacity burden of the industry. After the semi-boom of last summer the paper industry is now at an operating ratio of approximately 65 per cent. It is thus carrying an excess of idle capacity amounting to 35 per cent of the total, which is 15 per cent below the danger line.

"There are few industries in which the opportunity for sale of parts and replacement machines is as great as it is in the paper industry," said Mr. Willson. "Of the 683 fourdrinier machines representing 80 per cent of the total capacity of such machines in the United States industry, reported in the survey,

36 per cent were installed prior to 1900, and 81 per cent were installed prior to 1920. In point of age, only 19 per cent of the fourdrinier machines are relatively modern. The number of machines reported in operation at the present time that were installed before 1900 is surprising. It is at once a tribute to the manner in which these machines were built and an indication of the lack of development in the paper machine. Given a chance to rebuild its financial resources and given a chance to strengthen its market position, the companies that are operating these old machines constitute a tremendous source of business in replacement.

"Our statistics indicate that fourdrinier machines require a certain amount of rebuilding of major nature in approximately 15 year intervals. There is reason to believe that the periodic rebuilding that would otherwise have occurred since 1929 has not been maintained at normal levels."

Mr. Beaver, "pinch-hitting," as he expressed it, for John O'Leary, president of the Machinery and Allied Products Institute, who was unable to be present, enumerated at much length the plans and preparation for the formation of the Institute; of the events leading up to the code for the machinery industry, and went into detail explaining the purposes and import of the NRA. He stated that a system of industrial and productive control exists in most of the foremost countries of Europe, and that in his estimation we are headed for the same thing.

"The NRA is an attempt at reflation; to restore industry, prices and markets through the medium of control by industry itself," he said.

"The NRA battle is on, and there is no turning back," he remarked in closing his address, and ended by making a plea for patience, persistency and persuasion on the part of business men and the public in general.

Phillips Dennett was re-elected president of the National Association of Manufacturers of Paper and Pulp Machinery and Equipment; Charles L. Bauer, of Bauer Bros., was elected vice president, and W. B. Wilshusen, of the Cameron Machine Company, Brooklyn, N. Y., treasurer. These officers and the following comprise the Board of Directors: J. E. Waterhouse, general manager of the Montague Machine Company, Turners Falls, Mass.; A. B. Clark, president of the J. O. Ross Engineering Corporation, New York City, and S. G. Bevis, president of the Bevis Machine Company, Middletown, Ohio.

# Tests on the Automatic Control of Moisture Content of Paper

By E. F. NORDSTROM, Sales Engineer
Consolidated Ashcroft Hancock Co.
As told to Francis A. Westbrook, M. E.

IN DRYING newsprint it is necessary, as is well known, to keep the moisture content of the sheet between 7.5 per cent and 9.5 per cent, preferably between 8 and 9 per cent.

A series of tests made in a prominent Canadian paper mill on a machine equipped with ordinary air operated temperature controllers showed that each of the three backtenders on the machine turned out paper with a different moisture content. The average for a day's run was 9.15 per cent for the first shift, 8.20 per cent for the second, and 8.61 per cent for the third. Such averages, of course, are within the specified limits, but were obtainable only by each backtender attentively watching the temperature and adjusting the controller ten or twelve times per shift. Furthermore, the lack of uniformity of moisture content makes standardized operating procedures difficult. Consequently, a system of control resulting in fewer adjustments and a more closely maintained moisture content would be highly desirable.

Therefore, to obtain improvements in control over existing conditions, four tests were made with different arrangements of the averaging bulbs of controller and recorder.

The fourth test gave best results. In this case an automatic temperature controller of the latest design was installed with the steam bulb in the fourth dryer from the dry end of the machine. The averaging bulb was carried over the top of the machine across to the back side and there strung along to the top of the frame. It was brought in as far over the dryers as possible and below the returning felt. Thus it was subjected to the atmosphere surrounding the machine and was also influenced by the paper as its moisture content and weight varied.

The controller was arranged to compensate automatically the steam temperature in the dryers in accordance with the changes occurring in the atmosphere surrounding the machine. It was calibrated to operate on a two to one ratio; that is, for each two degree drop in the atmospheric temperature a one degree increase in the steam temperature was provided for. As the paper machine was heated by exhaust steam from a turbine plus some live steam, the controller was connected to a 2½-in. valve on the live steam line.

A recording thermometer steam bulb was located in the fifth dryer from the dry end and the averaging bulb wired to the averaging bulb of the controller. These averaging bulbs were located as far in over the machine as practicable so as not to subject them to room temperatures more than necessary. Live steam pressures were obtained from a recording pressure gauge on the main steam header supplying the machines.

Wet and dry bulb room temperatures were taken from a location on the end wall of the machine room. Similar outdoor temperature readings, as well as hygrometer readings, were also taken.

The data resulting from this study may be tabulated as follows:

| | |
|---|---|
| Time of run..... | 22 hours |
| Number of reels of newsprint tested for moisture ..... | 35 |
| Average moisture content ..... | 8.65% |
| Highest moisture content ..... | 9.70% |
| Lowest moisture content ..... | 7.50% |
| Number of hand adjustments of controller ..... | 14 |

The high peak of moisture content, 9.70 per cent, occurred with a weighting of the sheet. This weighting was deliberate because of a wet streak which developed about 24 inches in from the back side of the sheet. The paper was increased in weight on the front of the machine and the temperature increased slightly in order to dry it out evenly. Throughout the study it was noticed that the high peaks were usually caused by similar wet streaks which originated in the wet felts and were impossible to avoid. It was further shown that the controller held the moisture content of the sheet much closer than could the backtender with manual control and that the controller operated best when left alone. The low peaks were nearly all caused by a backtender changing the setting of the controller. The new controller, however, was adjusted only fourteen times in twenty-two hours as contrasted to ten or twelve adjustments in eight hours with the old controller. Furthermore, it was clearly shown that the controller, when once set, had better be left alone and that through so doing automatic regulation of moisture content will be obtained within closer limits than can be done by hand.

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## ◆ Elgin Softener Names New Representatives

The Elgin Softener Corporation, Elgin, Ill., announces the appointment of the L. A. Snider Engineering Service, 605 North Michigan Avenue, Chicago, as representatives of its entire line of water conditioning equipment in the northern Illinois and Indiana territories. Offices will be maintained in Indianapolis and Peoria as well as in Chicago for sales and engineering service of the Elgin equipment which includes boiler water deconcentration, continuous blow down and heat exchanger systems, boiler water chemical control, and industrial water softeners.

The L. A. Snider Engineering Service has had many years of experience in the power field, both in the capacities of consultants and sales engineers. Mr. L. A. Snider, who heads the organization, has been responsible for many major power projects in both Illinois and Indiana.

### ◆ Ingersoll-Rand Acquires G-E Turbo-Blower Business

Ingersoll-Rand Company has acquired the turbo-blower business of General Electric Company and will consolidate it with its own Turbo-Blower Department.

This acquisition places Ingersoll-Rand in position to meet demands for blowers and centrifugal type compressors for the broadest possible variety of uses.

Ingersoll-Rand is a long-established manufacturer of blowers of medium and large capacities, for pressures ranging up to 100 lbs. General Electric has specialized in both single and multi-stage units for a variety of services in low and medium pressures. Ingersoll-Rand also secures an exclusive license under the various General Electric patents.

This complete line of blowers now offered by Ingersoll-Rand includes low pressure units for aeration of sewage, ventilating and air conditioning systems, blowing cupolas, atomizing oil for furnaces, furnishing agitation air for flotation work, and for raw water ice systems, operation of pneumatic conveying systems, and developing pressures and vacuums in handling manufactured gas.

The medium-pressure machines cover the complete field for blast furnace and converter blowing and for gas booster work.

The manufacturing equipment previously employed by General Electric is being moved to Ingersoll-Rand's Phillipsburg, N. J. plant, where all types and sizes will be manufactured. Sales activities will be directed from Ingersoll-Rand Company's general offices at 11 Broadway, New York.

### ◆ "Paper" Will Exhibit at 1934 Exposition

Is there going to be a Paper Exhibit at A Century of Progress in 1934? There is.

The Paper Foundation, again representing the Paper Industry of the United States, will take advantage of its large investment in the House of Paper, its furnishings, display cabinets, etc., and use these as a nucleus for a bigger and better show in 1934.

In 1933 education was the keynote. The story of paper and how it is made, was told visually to 1,117,356 visitors, 119,186 of whom actually signed the visitor's register. In 1933 two and one-half tons of paper exhibitors' literature was distributed—all with an idea of making the public paper conscious.

It is felt the educational aim had been accomplished, and paves the way for the next most important keynote of the 1934 exhibit—Exhibitors' Products. In order to carry out the new deal, it has been thought necessary to present the various trade exhibits according to subject. Thus there will be 20 major subject exhibits selected from a list of 56 classifications. Some of the classifications are paper towels, letterheads, crepe paper, envelopes, gummed papers, etc.

A Century of Progress officials rated the Paper Exhibit of 1933 as seventh in importance while the statistical department has the figures to show it was far in the lead in popularity in the General Exhibits Building, where it will again be found next June.

There will be as last year a working demonstration to show how paper is made, and also a few mechanical operating exhibits. The House of Paper will be completely refurnished and redecorated for the occasion. At present it is not contemplated to take additional floor space.

William J. Miskella, Director of Research of the Mid-States Gummed Paper Company, who designed The House of Paper and superintended the installation of the exhibit last year, will again be in charge. The entire project was created starting ten days before the opening date and finished twenty days later. At times there were as many as thirty men working on the construction. Mr. Miskella was away during July and August but returned September 1st as general manager, which position he continues to hold.

Under the 1934 "new deal" everything will be organized far in advance. In fact, some of the proposed product exhibits are already quite well along. Each one of the attendants will use a special simplified form of inquiry to secure the names of prospects for the paper products of the 1934 exhibitors. Inquiries should be addressed to The Paper Foundation, 2433 South Damen Avenue, Chicago, Illinois.

◆ CHARLES SPIEGELHALTER, chief engineer of the Pusey and Jones Corp., passed away February 16 at Atlantic City. Mr. Spiegelhalter had been associated with the Pusey and Jones Corp, for 25 years.

◆ HAROLD B. RESSLER, vice president in charge of sales of Joseph T. Ryerson & Son, Chicago, will move to New York to take charge of the Jersey City plant. This move is made owing to the resignation of J. A. McNulty, former manager of the Jersey City plant and on account of the importance of this plant and the other eastern properties of the company.

### ◆ Identifying Coated Papers

A process for identifying coated papers, according to a recent announcement, has been developed by Sam Himmell, President of the Baldwin Paper Co., Inc., 61 Greene Street, New York City. This process, patented in the United States, England, France, Italy, Canada, Germany, Austria and Czechoslovakia, covers a method by which an identifying mark is pressed gently into the pulp of the paper on either side of the sheet beneath the coating. This mark, claimed not to injure the surface of the paper, is said to be invisible under ordinary conditions, but appears as plainly as the watermark of a bond sheet when held to the light.

At present, according to the announcement, there are only two brands of identified coated paper on the market; namely, Cantine's Markote, and Publisher's Coated Identified Paper, but it is felt that other manufacturers of coated papers will welcome the opportunity to protect their advertised brands against the possibility of substitution.

### ◆ Merco Nordstrom Annouces New District

The Merco Nordstrom Valve Company of Pittsburgh, Pennsylvania, subsidiary of the Pittsburgh Equitable Meter Compay, announce that they have established a new district to serve the territory of Central and Western New York State. C. F. Thomas, who has been acting as New York State representative for a number of years, will be District Manager in charge of the new territory, assisted by D. A. Gardner who has also represented the company in the past in various sections of the country.

An office will be opened at some point in this territory in the near future—the exact location to be announced as soon as negotiations have been completed.

### ◆ Gair Plants Incorporated as Subsidiaries

Announcement is made by the Robert Gair Company, Inc., that the company's six plants now operating as divisions have been incorporated as wholly owned subsidiaries under the following names:

Piermont Division is now known as Gair Cartons, Inc.

Thames River Division has become Gair Thames Containers, Inc.

Connecticut Corrugated (Shelton) Div. is Gair Shelton Containers, Inc.

Warner & Childs (Medford) is now Gair Boston Containers, Inc.

The name of the Haverhill Division is now Haverhill Boxboards, Inc.

Tonawanda Division has been changed to Tonawanda Boxboards, Inc.

### ◆ A New Use for the House Fly

Strenuous efforts are being made to show for the first time a new type of fly paper in the Paper Foundation Exhibit at A Century of Progress next summer.

Contrary to expectations, this new kind of fly paper is to be offered as a quality fine paper product and not as the sticky type one thinks about when fly paper is mentioned. Whereas ordinary fly paper has a large consumption in American homes, this new paper will have its largest demand in high class offices. In fact, the almost successful extermination of the house fly due to the use of sticky fly paper has made it most difficult to secure enough flies to make the new type of fly paper.

However, a source of the raw material has been found in foreign markets and it is the tiny wings and legs of European house flies which will be used to watermark the new type of fine paper for American consumption. The combination of actual flies and paper fibres in the process of manufacture is made scientifically possible because paper is a mechanical mixture and not a chemical one.

### ◆ Continuous and Automatic Beater Control

Coincident with the development of the Jones Multibeater, the E. D. Jones & Sons Co., Pittsfield, Mass., announces an automatic continuous electric method for control throughout the beating cycle by maintaining a predetermined load on the main driving motor. This load regulation is obtained by raising and lowering the roll on the bed plate through control equipment operating automatically.

This apparatus is known as the Stamets-Duckworth Beater Control.

### ◆ Motor Protected Against Burning Out

A self-protected a. c. induction motor which cannot burn out has been announced by The Lincoln Electric Company, Cleveland, Ohio.

This motor has a protective device built into the windings. Should the

motor be stalled through overloading, become excessively hot due to poor ventilation, run on single phase, or blocked for any other reason, the protector shuts off the current and the motor is saved from damage.

The motor is built in sizes from ½ to 30 hp. for either two- or three-phase and standard commercial cycles and voltages.

### ◆ New Gasket Type Drop Forged Pipe Coupling

A new gasket type drop forged pipe coupling, known as the Champion Positive Seal Pipe Coupling has been announced by the Champion Machine & Forging Co., Cleveland, Ohio. This coupling is said to make possible the joining of straight plain end pipe without grooving, threading, beveling or upsetting the ends and without any extra finishing operation being necessary.

The coupling consists of five distinct parts, viz.: two half coupling sections which contain gripping devices, one gas-

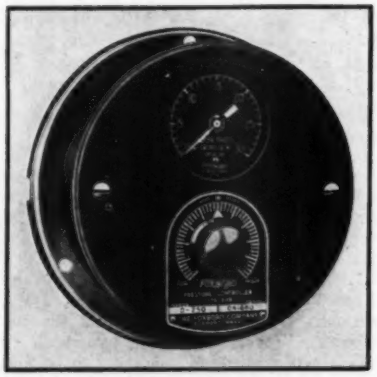
ket with metal protected sections and two bolts. Coupling sections are drop forged special grade steel; gripping rings are drop forged and heat treated and assembled into half coupling sections in such a manner as to become integral with coupling itself.

With this coupling it is claimed that joints can be effected by unskilled labor at low cost, and can be broken down and made up again any number of times without impairing efficiency of coupling.

### ◆ New Controllers for Temperature and Pressure

Two new control instruments have been developed by the Foxboro Company of Foxboro, Mass. Their appearance is practically identical, but one controls temperature, the other pressure.

The dial and knob on the lower face of the controller permits adjustment of the temperature or pressure within the range of the instrument. The indicating gauge above the adjusting knob shows the air pressure on the diaphragm



motor of the control valve and also shows whether the valve is opening or closing.

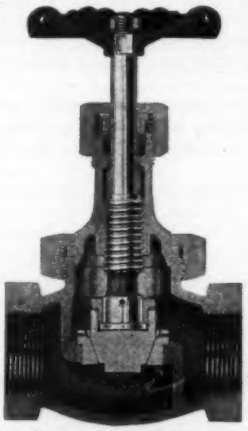
A two-inch dial type thermometer may be installed on the temperature controller in place of the air gauge. This thermometer is connected to the same bulb as the controller thus showing the temperature being maintained. The pressure controller may be equipped likewise with a high pressure indicating gauge that shows the pressure being controlled. In either case, it is necessary to mount a valve motor air gauge on the air line to the valve outside the case.

For the convenience of the trade, these controllers have been given type numbers. The temperature controller is Type 1119 and the pressure is Type 2119. More detailed information may be obtained by writing the manufacturer.

### ◆ New Plug Type Valve

For severe service demanding maximum resistance to destructive action on valve seat bearings, The Lunkenheimer Co., Cincinnati, Ohio, has developed Renewo and Ferrenewo valves with plug type NS5 alloy seats and discs.

NS5 alloy (patent applied for) is a new Lunkenheimer research development. It is non-ferrous composition of great hardness (300 Brinnell) which is said to be resistant to wear, abrasion,



erosion and corrosion and to retain its hardness at high temperatures. It is also claimed to be non-galling.

Iron body bronze mounted Ferrenewo plug type valves are made for 150 lb. SP., while the bronze Renewo valves are available in both 200 and 300 lb. SP. patterns.

Booklet 541-A, illustrating and describing these valves, will be sent on request.

### ◆ Push Button for Remote Control of Starters

The Electric Controller & Mfg. Company, Cleveland, Ohio, announces the new EC&M 270-A Type J Form C vaporproof and dust-tight safety lock-out push button for use in connection with the remote control of automatic motor starters.

This push button is for 3-wire voltage protection installations where it is desired to start and stop a motor through its magnetically-operated starter or controller from two or more push button control stations, at any one of which it may be desired to lock the push button in the "off" position to prevent operation of the motor-driven machine.

### ◆ Portable Current Transformer

The Esterline-Angus Company, Indianapolis, Ind., has announced a new portable current transformer for use with indicating and recording instruments. Each transformer has nine primary current ranges of: 10, 12.5, 25, 50, 100, 160, 200, 400 and 800 amperes capacity. The secondary capacity is 5 amperes, adapting it to use with all standard a.c. ammeters, wattmeters and power factor instruments.

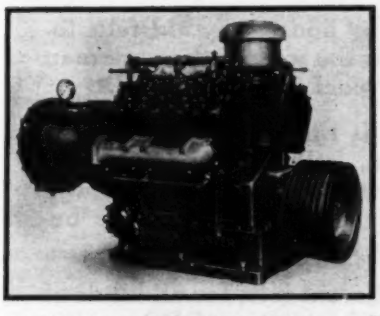
The containing cases are cast aluminum to withstand rough usage. After assembly, all moisture is removed from the windings and the case is then completely filled with an insulating compound which excludes all moisture.

These transformers are designed for use in all kinds of portable testing, and their range is such that they cover the usual capacities of electrical equipment used in industry.

### ◆ Water-cooled Vertical Air Compressors

A new line of vertical compressors, designed especially to achieve greater savings in air compressor costs, has just been announced by the Gardner-Denver Company, Quincy, Ill.

The inlet and discharge valves of these compressors are cushioned, and are said to be silent, durable, and efficient. Extra large water jackets completely surround the cylinders and valves



to minimize cylinder temperatures, and water-cooled inter-coolers cool the air between stages, thus saving power and increasing volumetric efficiency, according to the announcement.

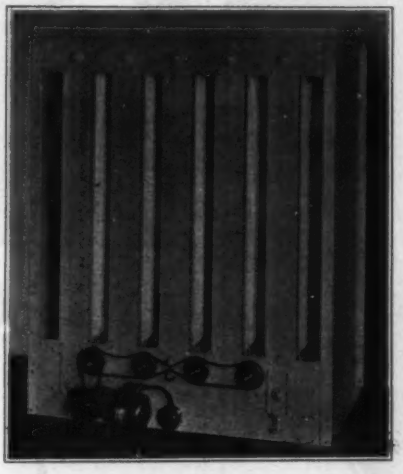
The crankshafts are of large diameter forged steel, and pressure feed lubrication to all bearings is obtained through drilled passages rather than through oil pipes. Constant and uniform oil pressure is maintained through the use of a rotary oil pump for each unit.

### ◆ Air Filter

An automatic, self cleaning air filter is being introduced by the Coppus Engineering Corporation, Worcester, Mass.

This filter employs a special wool felt for the filter curtain which is arranged in the shape of an endless belt running in zigzag fashion over the rolls. The edges of the filter curtain are reinforced by belts which have the double function of keeping the filter curtain in laterally stretched position and of providing an effective seal against passage of dirty air around the edges (patents applied for). The special wool felt is claimed to give the filter a very high cleaning efficiency, not only against dirt, but also against invisible floating dust.

The bottom rolls of the filter are connected by chains and sprockets to a small geared electric motor, which is started either by means of a time clock at predetermined intervals, or with the help of a sensitive pressure gauge when-

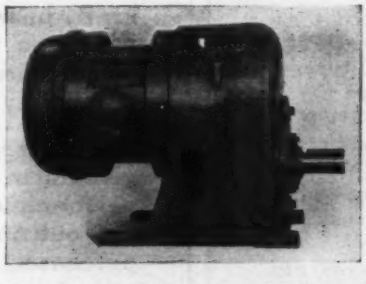


ever a maximum air resistance is reached. The filter curtain moves slowly over the rolls and passes over a special suction nozzle connected to a vacuum cleaner.

The automatic cleaning operation takes place while the ventilating system is in operation and is finished within 15 to 20 minutes. The motion of the filter curtain, as well as the vacuum cleaner motor is then stopped automatically.

### ◆ Single-Reduction Gearmotors

The Reliance Electric & Engineering Co., Cleveland, Ohio, has recently added single-reduction units to its line of gearmotors. These units, used for ratios up to 6:1 inclusive, can be furnished with both a-c and d-c motors of various types



in sizes rated ¾ hp. and up. Multi-speed and adjustable-speed motors may be used.

The entire reduction is obtained in a single pair of gears. Substantial feet, cast integral with the gear housing, afford a solid support close to the point of maximum torque application. Ball bearings are used throughout.

### ◆ Repair Material for Floors

A material known as Amolastic has recently been put on the market by the Floor Treatment Division of American Oil & Disinfectant Co., 129 East 26th Street, New York City, for use in repairing and resurfacing industrial floors.

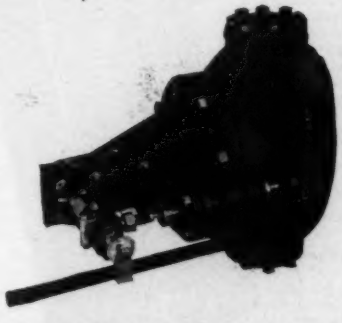
The amount of aggregate mixed with Amolastic is said to determine the hardness to which it will set up. The floor may be made as soft as rubber or by merely increasing the quantity of cement, sand and gravel or trap rock, a hard, durable, wearing surface is produced.

It is also claimed that Amolastic will bond to all types of floors—concrete, wood, asphalt, composition or brick.

### ◆ Remote Control for Liquid Level

The Swartwout Company, Cleveland, Ohio, has announced a device to control liquid level in tanks, condensers, receivers, and other vessels at remote distances.

In the announcement, it is stated that the unique feature of this new liquid level control is that the float chamber is equipped with full ball bearing construction of stainless steel balls and races. This design, said to eliminate friction caused by liquid under pressure, permits the control to operate valves



at any distance up to 300 feet, while the construction permits pressures up to 450 lb.

The operating mechanism is fully enclosed but is easily accessible for adjustment.

### ◆ "Right Light" Meter

A "Right Light" Meter for measuring light intensities and making illumination surveys is announced by the Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.

The principle of operation of the meter is a simple photovoltaic cell made of copper oxide on a copper disc which generates an electric current when subjected to light. The electric current is measured by a sensitive microammeter. It constitutes, therefore, a miniature light-operated generator transforming radiant light energy directly into electric energy which is measured by the microammeter. The electrical energy output is proportional to the light flux falling on the face of the Photox cell.

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Obtainable with SWW bars and bed plates. The line is complete—contains exactly what you require.

*Beater Bars*—Dowd staggered type (Pat.), Simonds-Dayton corrugated type, Simonds-Dayton vented type —and all other standard sections.

*Stainless steel and bronze bar* qualities forged for all types and styles of beater rolls.

*Bed Plates*—all standard patterns—whirlwind, open center and diamond.

*Paper trimming knives —Chipper knives, etc.*

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# *Choose your* FELTS *wisely*

**"Any rags, any bones, any old felts today?" That is the song of the junk man when he approaches a paper mill.**

**When a felt is through and ready for the rag man, sell it. Much better, though, to give it fair treatment and make it deliver maximum service before listening to the rag man's song.**

**There are different felts for all kinds of machine requirements. ORR makes them all . . . for cylinder, fourdrinier . . . for mills making book and bond, kraft, board, news print, tissue, name what you will. They are available in any required length, width and weight and in any practical weave.**

**If not already a user of ORR FELTS, give them a trial . . . compare their performance with that of others and let the outcome dictate your future felt purchases.**

## The Orr Felt & Blanket Co.

**Piqua, Ohio.**

The Photox cell and the microammeter which measures the cell current are mounted together in a neat moulded case. The cell is hinged, protecting it against breakage and protecting the instrument dial and Photox cell when the unit is not in use.

The "Right Light" Meter has a scale length of 1.8 inches and is divided into 50 divisions. The scale is accurately calibrated in foot-candles and is also divided into sections indicating the minimum amount of light considered satisfactory for various kinds of work and conditions.

The complete unit is of a convenient size so that it may be held in the hand and directed to various parts of the room, obtaining readings of intensities from all directions. This is accomplished by simply rotating the hinged cell to a position opposite the observer and pointing it in the desired direction.

## ◆ Capacitors for Dusty Atmospheres

A totally enclosed non-inflammable capacitor has been announced by the General Electric Company, Schenectady, N. Y. for use in dusty atmospheres. This new capacitor is treated and filled with Pyranol which is non-inflammable and which has extraordinary insulating and dielectric properties.

The capacitor dielectric itself is hermetically sealed, and connections are brought out through bushings into a dust-tight box which surmounts the unit. The dust-tight box is provided with conduit holes, each fitted with a dust cap and contains standard N.E.C. indicating fuses which can be inspected by removing the gasketed cover.

## ◆ A 23-11 Stainless Clad Steel

A new clad alloy, known as IngOclad 23-11, has been developed by the Ingersoll Steel & Disc Co., a division of the Borg-Warner Corporation, Chicago. It is a two-ply stainless steel having a 20 per cent stainless layer of 23 per cent chrome, 11 per cent nickel bonded to a back of mild carbon steel and produced under the well-known Ingersoll Ingot Patented Process—the same process that has been producing an 18-8 grade of IngOclad during that past several years.

It is claimed that this material will resist the forms of damaging corrosion attack encountered in both sulphite and sulphate pulp and paper mill applications to better advantage than the regular 18-8 series of alloys and at a price which is materially less than the cost of comparable solid stainless steels. When welded with a 25-12 chrome nickel electrode the new alloy is said to be equal or superior in corrosion resistance to the special types of 18-8 stainless steels for most pulp and paper mill applications.

The material, available in sheet or plate form in all commercial sizes, may usher in a new trend throughout the industry toward the wider use of corrosion resistant alloys to improve papers and add to the life of mill vats, tanks, machinery and equipment.

## ◆ New Catalogues and Publications

**American Asphalt Paint Co.,** Chicago—A most attractive brochure, "Color and Protection," has recently been sent out by this company, manufacturer of Valdura products. This is a book of authentic water-color illustrations of the buildings at A Century of Progress, for which this company furnished and applied the paint. The Fair Management has credited this book as being the only reproduction of the genuine flat color effects as designed by the late Joseph Urban. It is printed in 13 water-colors, silver and gold, and contains 35 fine reproductions of the actual buildings in actual color. Copies may be obtained by writing the company at 43 E. Ohio Street, Chicago, on your company letterhead.

**Allis-Chalmers Mfg. Co.,** Milwaukee, Wis.—This company has prepared a revised leaflet, No. 2134-A, giving engineering data, such as sheave diameters, number of grooves, bores and other dimensions on Texsteel Sheaves for Texrope Drives.

**Brown Instrument Co.,** Philadelphia—A new broadside displays information on the Brown Electric Flow Meter. Copies of this folder, also catalogue 2002, giving more details, will be sent upon request.

**John W. Bolton & Sons, Inc.,** Lawrence, Mass.—This company has just sent out a folder devoted to the Bolton Wedgeless Plug. This plug, it is claimed, takes any size knife just like a universal tool holder. A number of prominent paper mills are listed as users.

**Dominion Engineering Co.,** Ltd., Montreal, P. Q.—The first issue of this company's magazine, "The Dominion Engineer," has been received. It is said that succeeding issues will be devoted mainly to articles of specific interest to engineers and plant and mill executives. Publication data will be about the 15th of each month, and besides articles of general interest relating to mechanical equipment for various purposes and articles of a technical nature indicating modern engineering trends, there will be interesting items concerning the products and shop facilities of both the company and its associates.

**B. F. Goodrich Rubber Co.,** Akron, Ohio—The 1934 edition of this company's Operators Hand Book has just been published and is available upon request. All Goodrich tires for truck and buses are listed with their complete specifications and description of the right tires for varied purposes. A large number of specification tables are included. A table giving the weight of various commodities and a changeover guide for 1½-ton trucks are also features of the publication.

**Jeffrey Manufacturing Co.,** Columbus, Ohio—Bulletins Nos. 579, 581, 582 and 583 describe the outstanding features of construction and operation of Jeffrey-Traylor vibrating screens, vibrating conveyors, vibrating feeders and vibrating coolers and dryers. Typical installations of each device is illustrated in its respective bulletin. Copies upon request.

**The LaBour Company, Inc.,** Elkhart, Ind.—A new booklet, "Performance and Test Standards," has been issued by this company. It is a handbook of 30 pages setting up performance and test standards for self-priming centrifugal pumps. The booklet includes individual sections on definitions and qualifications, self-priming centrifugal pump standards, factory tests, factory testing equipment, useful pumping data, and operating information. The company will send copies to anyone having a reasonable use for them.

**Louis Allis Co.,** Milwaukee, Wis.—New literature recently sent out by this company includes: a new magazine entitled "The Louis Allis Messenger" which will be issued bi-monthly. This publication will be devoted to new developments in the field of electric motors as well as to the presentation of data on the care and operation of motors. Copies will be sent gratis to those requesting same. The company has also issued bulletin No. 505-C, which shows the detailed construction of its motors and completely illustrates and describes the characteristics and uses of different types of motors. Copies free.

**Norma-Hoffman Bearings Corp.,** Stamford, Conn.—Bulletin No. 934-A is devoted to Norma-Hoffman Ball and Roller Bearing Pillow Blocks. The items illustrated and described by complete specifications are equipped with various types of self-aligning Precision bearings of either ball or roller type. A complete range of 2-bolt and 4-bolt pillow blocks, with bearings is presented, together with a large amount of specification data.

**Poole Foundry & Machine Co.,** Woodberry, Baltimore, Md.—This company has just distributed a new 302-page catalogue of machine moulded gears, listing approximately 10,000 different sizes, kinds and types of gears. These gears range in size from 3" diameter to 15 ft., weighing from 5 lbs. to 70,000 lbs. The catalogue contains a number of illustrations and diagrams and will be sent gratis.

**Quigley Company,** 56 W. 45th St., New York City—An interesting folder featuring this company's Triple-A No. 44 Aluminum has just been received. The folder is printed in black and silver. The manufacturer claims this aluminum coating to be an unusual product in that it primes, protects and decorates the surface with one application. Among its outstanding characteristics, it is claimed it is adaptable for application on damp surfaces; that it displaces the moisture and seals the surface.

**Roots-Connersville Blower Corp.,** Connersville, Ind.—A bulletin, No. 60-B10, descriptive of cycloidal rotary pumps, includes a description and illustration of this company's new Type "R" pump. In this pump, the cylinder is made integral with the base, with the inlet at either side to suit individual plant piping conditions. Discharge is at the top. Large diameter shafts are supported on four anti-friction bearings. Timing gears are machined from forged steel blanks, and heat-treated. Bearings and gears are protected from contact with the fluid being handled by improved stuffing boxes. Any standard driving arrangement is available and illustrations show single pulley, direct-coupled, and V-belt pumps, operated by gasoline engine and electric motor.

**Taylor Forge & Pipe Works,** Chicago—Taylor Spiral Pipe, riveted or welded, is the subject of this company's Catalog 33, just issued. The many advantages claimed for Taylor Spiral Pipe; its uses and adaptability in many industries, and for export; list of prices and information for ordering are included in the contents. The book is attractively laid out and bound and contains a large number of interesting pictures. Copies upon request.

**Thwing Instrument Co.,** Philadelphia, Pa.—Leaflet No. P-340 describes the complete line of paper testing instruments manufactured by this company, and would be of interest to any mills in need of new testing equipment.

**U. S. Steel Corporation**—An exceptionally attractive brochure entitled U. S. S. Stainless and Heat Resisting Alloy Steels has been prepared under the direction of the Committee on Stainless and Heat Resisting Steels, Subsidiary Manufacturing Companies of the U. S. Steel Corp. This publication is a complete and concise treatise of the subject and has been prepared and presented in an unusually interesting style. There are a number of halftones and the book is embellished with designs and trim of silver and scarlet.

**Westinghouse Elec. & Mfg. Co.,** East Pittsburgh, Pa.—"Engineering Achievements of 1933," by H. W. Reding, of this company, has been prepared in booklet form, reprinted from The Electric Journal for January, 1934. One chapter of this article is devoted to developments in the paper manufacturing field. The booklet is well illustrated and very attractive.

# Better *by* Comparison

We mean that literally. Buffalo pumps are never so thoroly appreciated as when they are operated in competition with other pumps on the same service.

One mill made extensive comparative tests five years ago. Previous to the tests—not one Buffalo pump was installed in that mill. Since the test—no pumps except Buffalo have been installed there.

We can refer you to many mills where these pumps are making performance records. Can you afford not to try them?

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**213 Mortimer St., Buffalo, N. Y.**
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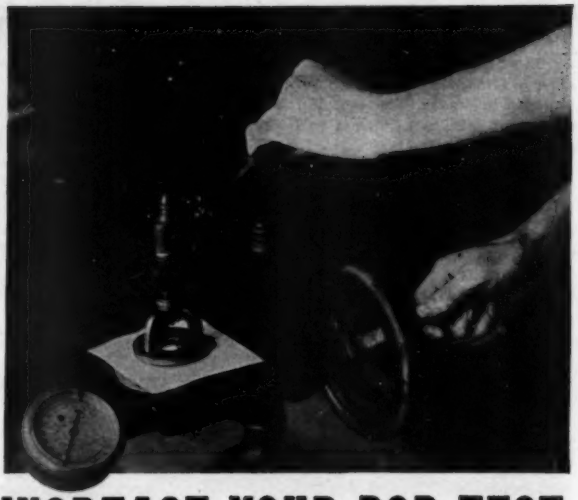
## "Buffalo" Non-Clogging Stock Pumps

*A Buffalo 6" pump handling 6% Kraft Stock from broke beater.*



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## with P.Q. SILICATE of SODA

AROUND goes the dial. Pop goes the sheet! The reading shows a ten percent increase for the sheet sized with P. Q. Silicate of Soda. A report from one mill—"Occasionally a paper may run too low in strength and an increase of silicate alone in the furnish will raise the test one or two pounds or even more."

For this advantage alone many mills use P.Q. Silicate in the beaters. Other benefits include improved surface, greater retention of fiber and fillers, increased ink resistance.

Write now and ask us to show you how silicate can be used in your sheet.

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# POWER

## GENERATION + UTILIZATION + MAINTENANCE

**This section turns the searchlight on power and its allied problems, showing big possibilities to save. Opportunities to improve conditions, methods, apparatus will be discovered. Worth while practices suggest new ideas and wider usages of equipment.**

By W. S. JOULE

### ◆ Generator Lubrication

Two parts of a generator require lubrication: first, the bearings; and second, the brushes. The lubrication requirements of generator bearings do not differ materially from those of other bearings; the oil used must be selected to suit conditions of size, speed, pressure, temperature and mechanical condition. Where the bearings are small, the shaft speed high, where the pressure and temperature is low and where the mechanical conditions are good, a light bodied quick acting oil must be used. Heavy-bodied oils must be employed where the bearing are large, the shaft speed low and where pressures or temperatures are high. High speed shafts are those running over 300 r.p.m.

Normal operating temperature in generator bearings should not exceed 140 deg. Fahr. Whenever this temperature is exceeded, the cause should be investigated.

On turbo-generators, where circulating oil systems are used, the temperature of the oil returning from the bearings should not be more than 130 deg. If the temperature runs higher, it indicates insufficient cooling capacity. Where the main bearings are water-cooled, the temperatures are lowered by about 10 deg. Fahr.

Oil in ring oiled or other reservoir type of bearings must be renewed at least every 6 months. New oil from the barrels in which it was delivered should always be poured through a strainer into the oil can, to avoid chips of wood and other impurities getting into the bearings.

When bearings on small generators heat up, they are usually easy to cool down, as the total amount of heat present in the bearing is relatively small. Generally, a liberal supply of the oil in use is all that is required. If the bearings are heated to such an extent that they have been distorted or that the white metal has started to flow, the unit will have to be shut down and the bearings overhauled.

When the bearings on large machines heat up, the case is different. The first thing to do is to increase the bearing clearance by slacking back the brasses. If the bearing has not seized but is extremely hot, it is usually sufficient to feed into it a liberal supply of steam cylinder oil (which possesses superior lubricating qualities under high temperature) until the bearing cools.

It is also a good plan in case of a hot bearing to reduce the speed immediately. Do not bring the machine to a dead stop, however, as this might cause the bearing to "freeze."

Brushes, as a rule, do not require much lubrication. It is often recommended to boil carbon brushes in refined paraffin wax, but a trace of vaseline applied to the commutator is generally equally satisfactory. Graphite or graphitized carbon brushes are self-lubricating and as a consequence need no other lubricant. Graphitized carbon brushes will operate successfully at any angle and will give satisfactory results for most commercial applications. Oil should never be applied to the commutator on which graphitized brushes are used on account of the formation of smut on the commutator surface, which causes poor commutation.

In case it is necessary to use non-lubricating brushes, it is good practice to equip the machine with alternate sets of self-lubricating and non-lubricating brushes, the latter depending upon the former to supply whatever lubrication is needed.

The brushes used on alternating current slip rings should be as nearly self lubricating as possible and should not wear or cut the rings.

◆ A SIMPLE METHOD of determining the polarity of the wires of a direct-current circuit, is to place the two leads about ¼ in. apart on a piece of moistened blueprint paper. The paper around the negative will turn white. It is well to place a lamp in series with one of the leads to avoid a possible short-circuit.

### ◆ Stopping Boiler Leaks

The general rule may be laid down that no attempt should be made to stop leaks while the boiler is under steam pressure. All leaks should be called to the attention of the chief, who, in important cases, will do well to call an inspector or competent boilermaker. Note should be made of the exact position of a leak at the time it is discovered, and a mark should be put upon the place of the leak itself. Leaky seams and rivets and leaks about nozzles can usually be made tight by calking. Leaky joints due to the presence of oil in the water can only be prevented by keeping the oil out of the boiler. In any case, the cause of a leak should be found and removed.

The ring seam over the fire in the case of horizontal tubular boilers usually shows a much more rapid deterioration than any other part of the boiler. A combination of the conditions of rolling (both in the original manufacture of the plate and in the forming of the plates in the boiler shop), the high temperature of the metal due to the double thickness, and the local pressure due to the driving of the rivet may result in so bad a condition that patching may be necessary. Before resorting to patching, however, calking may be tried around the rivet and in other places where the steam may get through. Cracks often form extending from the rivet to the edge of the plate, and while these are often troublesome they are not usually dangerous unless the crack extends inside from the rivet. If calking is not effective, a patch may become necessary. The form of the brick setting is sometimes responsible for rapid deterioration and some slight change may be made in it to improve these conditions. Before any patching is undertaken careful thought should be given to the question: "Is it worth while?"

Calking should always be done with a round pointed tool. A square or sharp tool is liable to injure the plates by forming a slight groove which may increase rapidly by corrosion and by working of the plates under expansion and contraction. Heads of leaking rivets may be made tight by calking around with a round pointed tool. Opposite head of rivet should be supported if possible while calking is being done.

◆ THE THINNER the packing between a cylinder head and the cylinder, the better. Thick packing is more likely to blow out, and the additional thickness unnecessarily increases the clearance in the cylinder.

### ◆ To Prevent Spontaneous Combustion in Coal Storage

Do not pile in cones; pile evenly not over 12 feet high and so that any point in the interior will not be over 10 feet from an air-cooled surface.

If possible, store only screened coal.

Keep out the dust as much as possible by reducing the handling to a minimum.

Pile so that lump and fine sizes are distributed evenly, not allowing the lumps to roll to the bottom and form air passages.

Do not store near outside heat sources although moderate in degree.

After mining allow six weeks' seasoning before storage.

Avoid alternate wetting and drying.

Prevent air reaching the interior of the pile by avoiding interstices around timbers and brickwork or through porous bottoms such as course cinders.

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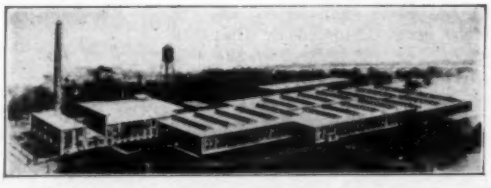

*KENWOOD MILLS LTD. ARNPRIOR ONTARIO, CAN.*

### ◆ G-E Employes Receive Coffin Foundation Awards

Revelations of exceptional achievements by employes of the General Electric Company were contained in awards that have been made by the Charles A. Coffin Foundation to 32 men on the company's payroll. These citations are for contributions by the recipients during 1933 to the progress and prestige of the company and to the advance of the electric art.

The awards are divided among ten engineers, seven factory foremen, five shop workmen, four commercial men, three tool designers and expert machinists, two administrative employes and one construction engineer. No less than seven of the awards, one a joint citation of three men, relate to General Electric's refrigerator. Three others are concerned with the Thyratron tube, a widely used control device originated in the General Electric research laboratory; and three others have to do with the incandescent electric lamp, the company's historic "queen product." Three joint awards go to men who handled General Electric's exhibits at the Century of Progress exposition, particularly its far famed "House of Magic."

As in other years the stories of the work for which these prizes are given bring out resourceful ingenuity in the field of invention, contributing to a better quality of product and particularly to the reduction of manufacturing costs; service to customers in emergencies under extraordinary difficulties; and initiative by employes who went outside their prescribed duties when an opportunity was seen for improving products or methods, sometimes accomplishing results where others had tried without success.

Each citation consists of a certificate and a cash award. The Charles A. Coffin Foundation has been making awards of this sort every year since 1922, when it was established by the board of directors of General Electric as a tribute to the late Charles Albert Coffin, founder of the company and its first president.

The joint award for work done at the Century of Progress goes to William A. Gluesing, who conducted and supervised the demonstration lectures of the House of Magic, visited by 700,000 persons; Kenneth R. Ross, service contact man; and George E. Simons, publicity contact man. Loyal V. Bewley, engineer in the power transformer department at Pittsfield, Mass., is cited for a revolutionary new mathematical theory which greatly aids engineers in safeguarding transmission lines from lightning. Thomas O. Moffit, a foreman in the Newark lamp works, wins an award for devising a manufacturing process which practically eliminates the unsightly white streaks and spots on the globes of automobile lamps. S. R. Bergman, consulting engineer at the River Works, West Lynn, Mass., is honored for devising a new type of bucket manufactured by General Electric for rayon manufacturers, which has banished previous failures in this piece of equipment. Guy S. Purvis, construction engineer of the Chicago office, receives an award for his emergency work in restoring to service the municipal electric plant of Rensselaer, Ind., following a severe cloudburst and flood last spring, during which job he put in an average of twenty-two hours a day for a week, and saved a man's life in a gasoline fire. Frank M. Clark, physicist in the laboratory of the Pittsfield Works, is cited for his development of Pyranol, a non-inflammable and non-explosive liquid as a substitute for oil in the insulation of transformers.

Two of the prize winners, Mr. Purvis and Mr. Clark received awards from the Coffin Foundation in previous years, Mr. Purvis in 1926 and Mr. Clark in 1931.

### ◆ All Stearns Conveyor Equipment Transferred to Milwaukee

The Chain Belt Company of Milwaukee, Wisconsin, has recently completed the transfer to Milwaukee of all of the manufacturing operations of its wholly owned subsidiary, The Stearns Conveyor Company of Cleveland, Ohio. The last operation to be moved to the Milwaukee plant is the manufacture of the Rex-Stearns Belt Conveyor Idlers.

The Chain Belt Company acquired The Stearns Conveyor Company by outright purchase of the capital stock in 1926. For several years the Cleveland Plant was operated as a


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| Rails, Plates | Chain | Welding Rods | Tool Steel |
| Sheets—Steel, Copper Bearing and Armco Ingot Iron —Plain, Galv. and Corrugated | Turnbuckles Shafting Mechanical Tubing Boiler Tubes Boiler Fittings | Solder Refined Iron Stainless Steel Babbitt Metal Ryertex Bearings | Floor Plates Safety Treads Small Tools Machinery |

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They are water lubricated » » Consume less power » » Help produce cleaner stock » » Quickly replaced » » Will run submerged in pulp stock » » Last longer » » Practically unaffected by acid solution. *Write for Bulletin 42*

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"SHAF-TITES" CHECK THEIR OWN AGE

Every Rodney Hunt Shaf-tite Roll has the month and year of building die-stamped into the end of the shaft—a permanent key for checking the service, fair evidence that the maker is confident of long wear.

Write for free sample Shaf-tite Roll, showing the advantages which insure long life. Address 73 Maple Street.

Shaf-tite Rolls are positively the lowest-priced quality rolls on the market. Mass production methods Rodney Hunt is the world's largest roll maker permit many savings that cannot be made by the other roll builders

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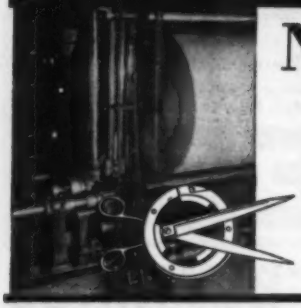
Wood, Metal, Rubber-covered, Etc.

LANGSTON SLITTERS



NOTED for producing firm, tightly wound rolls with straight, dust-free edges, Langston Slitters combine high-quality production with low operating costs.

Samuel M. Langston Co., Camden, N.J.

HUDSON-SHARP Machine Company
DEPT. I
Green Bay . . . . . Wisconsin

MANUFACTURERS OF THE MOST MODERN AND COMPLETE LINE OF PAPER CONVERTING MACHINERY IN THE WORLD. YOUR INQUIRIES ARE RESPECTFULLY SOLICITED.

WOODEN TANKS

Agitators
Stuff Chests
Flumes and Penstocks
Lead Lined Tanks
Rubber Lined Tanks
(WOOD OR STEEL)
Blow Pits
(INCLUDING THE PATENTED ELLIPTICAL BLOWPIT)

**WANTED**—Paster, Friction Calender, Flint Glazer and Embossing Equipment. Address Box 214, THE PAPER INDUSTRY.

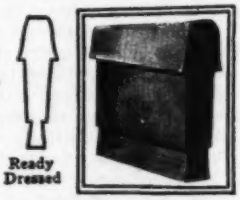
**ASSISTANT MANAGER FOR LARGE BOOK PAPER MILL,** preferably with technical training. Must have had extensive experience in handling operating problems and demonstrated ability in handling men. Reply giving age, education, training, experience, previous salary and salary expected. Enclose small photo if convenient. Address Box 216, THE PAPER INDUSTRY.

**ASSISTANT MANAGER FOR COATED PAPER MILL,** preferably with technical training. Must have had extensive experience in handling operating problems and demonstrated ability in handling men. Reply giving age, education, training, experience, previous salary and salary expected. Enclose small photo if convenient. Address Box 217, THE PAPER INDUSTRY.

ROLLWAY BEARING
COMPANY INCORPORATED
SYRACUSE ROLLWAY CYLINDRICAL ROLLER BEARINGS NEW YORK

"READY DRESSED" MILL COGS
*LABOR SAVING—TIME SAVING*

THE MOST ECONOMICAL FILLING THAT CAN BE PUT IN A MORTISE WHEEL




WE MAKE ANY STYLE OR SIZE WANTED
WRITE FOR INSTRUCTION SHEET "O" WHICH IS FREE

QUICK SERVICE ON ALL SIZES
THE N. P. BOWSHER CO., So. Bend, Ind.

**Lessons in Paper Making**

*By* **Harry Williamson**

One of the greatest funds of information on paper making ever published for the mill man.

Part I contains the first twelve lessons and two separate articles—A Problem in Head Box Control and The Degree of Hydration. Price 50c.

Part II contains fourteen lessons and one separate article—Safety Practice in Machine Room. Price 50c.

THE PAPER INDUSTRY
333 N. Michigan Ave. CHICAGO, ILL.

separate unit, but later the sales and engineering were merged with that of the Conveyor Division of the parent company in Milwaukee.

All of the gray iron, malleable iron and special metal foundries of the Chain Belt Company are located in Milwaukee. This final transfer of the Stearns operation will therefore eliminate all of the inter-plant shipments that have previously been involved and will, of course, permit of consolidated shipments to the trade.

L. B. McKnight, formerly secretary and sales manager of The Stearns Conveyor Company, has, since the consolidation of the sales and engineering of the two companies in 1932, been Manager of Conveyor Sales for the parent company. George M. Dyke, vice president and operating manager of The Stearns Conveyor Company, formerly a member of the Chain Belt organization, will again be associated with the parent company in an executive capacity.

### ◆ Wisconsin Paper Group Holds Election of Officers

The Annual Meeting of the Wisconsin Paper Group was held on February 2, 1934, at the Valley Inn, Neenah, Wisconsin. The following mills were in attendance.

The Appleton Coated Paper Co.
Bergstrom Paper Company
Central Paper Company
Dells Pulp & Paper Company
Fox River Paper Company
Gilbert Paper Company
Kimberly-Clark Corporation
Neenah Paper Company
Rhinelander Paper Company
Riverside Paper Corporation
Whiting-Plover Paper Company

The following officers were elected and have already assumed active work in the organization:

President, D. W. Bergstrom, Bergstrom Paper Company.
Vice-President, Leo E. Croy, Menasha Products Corporation.
Secretary-Treasurer, Leo O. Schubart, Neenah Paper Company.

It was voted to increase the Executive Committee to seven members and the following were named:

D. W. Bergstrom, Bergstrom Paper Company.
Kimberly Stuart, Neenah Paper Company.
Leo E. Croy, Menasha Products Corporation.
C. B. Clark, Riverside Paper Corporation.
Fred C. Heinritz, The Appleton Coated Paper Company.
Richard F. Bellack, Whiting-Plover Paper Company.
John A. Wesley, Rhinelander Paper Company.

The officers and Executive Committee have since hired a full time secretary and opened permanent offices in the Neenah State Bank Building, which will greatly facilitate the services of the Group. The Secretary appointed is Mr. Irwin Pearson, who will work in close connection with the Traffic Committee, consisting of P. J. Reimer of the Gilbert Paper Company, J. E. Hafstrom of the Menasha Products Corporation, Herman Krueger of the Riverside Paper Corporation and Henry Krueger of the Fox River Paper Company.

The Advertising Committee is headed by E. S. Colvin of The Appleton Coated Paper Co. and consists of Mr. Colvin, R. F. Bellack of Whiting-Plover Paper Company, Mark Peacock of Bergstrom Paper Company, and Stuart Thompson, of Central Paper Company.

With these changes, the Wisconsin Paper Group widens the scope of its activities considerably. The state of Wisconsin has some fifty-five paper mills, manufacturing well over two hundred different grades of paper. The various grades of paper move into every market in this country and into many foreign countries. The purpose of the Wisconsin Paper Group is to aid in expediting service on these various papers to the trade. Full cognizance is taken of modern-day trend of merchandising and the Group offices at Neenah are now in position to answer promptly all inquiries relating to this large number of mills and their products.

◆ EVERETT CHAPMAN, who joined Lukenweld, Inc., division of Lukens Steel Co., Coatesville, Pa., early in 1930 as director of Engineering and Research, has been elected vice president. The company is engaged in the design and manufacture of welded steel assemblies for machinery and equipment. Mr. Chapman taught electrical engineering at Purdue University and later served the Lincoln Electric Company of Cleveland on experimental research and development.

No bragging intended; but it's a fact that we've built up a sizeable mail-order-business with ARMCO SPIRAL WELDED PIPE. It is convenient for our 57 paper mill customers; for they know that whether they order 10 lengths or a hundred, they will get the same good money-saving pipe . . . Pipe that's quickly obtained, easily installed; pipe that stands up under wear, tear and corrosion. ARMCO PIPE is made straight, true-round and smooth inside. It's manufactured from INGOT IRON for rust-resistance and spiral welded for great strength. Maybe you would like to order it by mail, too. Just tell us your needs—the use, sizes, and number of lengths. You'll get ACTION!

THE AMERICAN ROLLING MILL COMPANY
*Executive Offices:* Middletown, Ohio

ARMCO
SPIRAL WELDED PIPE

STRONG ★ EASILY-HANDLED
SMOOTH INTERIOR

**HARDY S. FERGUSON & COMPANY**

**CONSULTING ENGINEERS**

200 FIFTH AVENUE — NEW YORK CITY

Hardy S. Ferguson—*Member A.S.C.E. A.S.M.E. E.I.C.*
Moses H. Teare—*Member A.S.C.E. A.S.M.E. E.I.C.*
J. Wallace Tower—*Member A.S.C.E. A.S.M.E.*

*Consultation, reports, valuations, and complete designs and engineering supervision for the construction and equipment of*

PULP AND PAPER MILLS
AND OTHER INDUSTRIAL PLANTS
STEAM AND HYDRO-ELECTRIC
POWER PLANTS
DAMS AND OTHER HYDRAULIC
STRUCTURES

**TAYLOR STOKER**

The economical way to burn coal under big boilers

Unfailing reliability, convenience, and economy are yours when you install a Taylor Stoker. When used for revamping an old boiler, the Taylor Stoker saves coal and provides increased capacity. It soon pays for itself out of the economies effected.

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**VEST POCKET POWER PLANTS**

Small space occupied, any capacity, low over-all operating costs, high and extreme efficiencies, reliability, low initial investment.
Complete power plants to meet any operating conditions of Pulp and Paper mills or other industrial service. Engineering and Construction.

Satisfactory Services Always Guaranteed.

**FERGUSON ENGINEERS**

Power Specialists
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**Pulp and Paper Mill Screens**

of STAINLESS STEEL—COPPER—BRONZE—
MONEL — CHEMICAL RESISTING ALLOYS
Perforations that are accurate in size and alignment
ANY METAL •• ANY PERFORATION

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5654 Fillmore St., Chicago, Ill. ◆ 114 Liberty St., New York, N.Y.

PULP MILL MACH'Y ◆ FINISHING ROOM MACH'Y
◆ FRICTION CLUTCHES ◆

**The Moore & White Co.**
PHILADELPHIA, PA.
N. PHILA. STA. PENNA. R.R.
PAPER MILL MACHINERY

**Lindsay Wires**

This company was the pioneer in the manufacture of Longcrimp wires, which are giving outstanding service.

Our Modified Longcrimp represents the latest idea in that type of Fourdrinier Wire. It minimizes wire marks and has the extra life of Longcrimp.

Our Spiral Weave wires prevent seams from scoring.

Last in line, but not least in the lineup, we have our Duowear wires. They have exceptional wearing qualities.

**The Lindsay Wire Weaving Company**

14025 Aspinwall Ave. — Cleveland, Ohio

1864 *The Qualifications of* 1934

**EXCELSIOR FELTS**

*are embodied in their name*

**E**limination of felt marks
**X**actly as you want them
**C**arefully manufactured
**E**asy starting and non-blowing
**L**asting qualities
**S**atisfying performance
**I**mmeasurably successful
**O**rder today and
**R**educe your felt costs

**CYLINDER WETS**
(Open and water shedding)

70 years of experience in felt manufacture.
Maximum tonnage obtained if run over

**EXCELSIOR FELTS**

*Manufactured by*

KNOX WOOLEN COMPANY
CAMDEN, MAINE

*Sold by*

BULKLEY, DUNTON & COMPANY
75 Duane St., New York, and direct

# The Paper Industry Safety Contest

**July 1, 1933, to June 30, 1934**

**Scores as of January 31, 1934 (Cum.)**

**10 Mills Keep Perfect Score**

**PERFECT SCORES**

**Division I—Paper and Pulp Mills**

| | PARTICIPANT | MILL | LOCATION |
|---|---|---|---|
| GROUP A | | | |
| GROUP B | St. Croix Paper Co. | Woodland | Maine |
| GROUP C | | | |
| GROUP D | Upson Company | Lockport | New York |
| | Hollingsworth & Whitney Co. | Aroostook & Cobbassee | Gardner, Me. |
| | International Paper Co. | Continental Div. | Ashland, N. H. |
| | Bird & Son, Inc. | Roofing Plant | Chicago |
| | International Paper Co. | Livermore | Maine |
| | International Paper Co. | Riley | Maine |
| | Hollingsworth & Whitney Co. | Abenaquis | Madison, Me. |
| | Spaulding Fibre Co., Inc. | Hayes | No. Rochester, N.H. |

**Division II—Remanufacturing**

| | | | |
|---|---|---|---|
| Southern Container Co. | Houston | Texas | |

**IMPERFECT SCORES**

| | Key | Rank | Points Credit | Points Debit |
|---|---|---|---|---|
| GROUP A | PA- 2 | 1 | 945.632 | |
| | PA-17 | 2 | 883.588 | |
| | PB- 9 | 3 | 867.866 | |
| | PA- 6 | 4 | 833.122 | |
| | PA-11 | 5 | 666.704 | |
| | PA- 5 | 6 | 656.006 | |
| | PA- 7 | 7 | 641.806 | |
| | PA- 1 | 8 | 593.200 | |
| | PA- 4 | 9 | 479.910 | |
| | PA- 8 | 10 | 479.382 | |
| | PA- 3 | 11 | 437.582 | |
| | PB- 2 | 12 | 233.434 | |
| | PA-16 | 13 | 51.818 | |
| | PA-12 | 14 | | 67.176 |
| | PA-15 | 15 | | 143.690 |
| | PA-13 | 16 | | 154.654 |
| GROUP B | PC-10 | 2 | 917.232 | |
| | PB- 6 | 3 | 857.346 | |
| | PB- 7 | 4 | 737.528 | |
| | PB- 3 | 5 | 702.354 | |
| | PB-15 | 6 | 607.882 | |
| | PB- 1 | 7 | 603.330 | |
| | PC- 7 | 8 | 537.768 | |
| | PB-11 | 9 | 312.814 | |
| | PB-14 | 10 | 192.902 | |
| | PB-13 | 11 | 151.021 | |
| | PB- 4 | 12 | | 165.066 |
| | PC- 2 | 13 | | 468.362 |

**DIVISION II**

| | | | |
|---|---|---|---|
| RB-1 | 2 | 945.736 | |
| RC-1 | 3 | 922.670 | |
| RD-4 | 4 | 724.870 | |
| RD-1 | 5 | 585.578 | |
| RD-5 | 6 | 519.750 | |
| RC-2 | 7 | 377.422 | |
| RD-6 | 8 | 305.590 | |
| RD-3 | 9 | | 471.070 |
| RD-7 | 10 | | 893.560 |

| | Key | Rank | Points Credit | Points Debit |
|---|---|---|---|---|
| GROUP C | PC- 6 | 1 | 885.846 | |
| | PC-22 | 2 | 761.882 | |
| | PD-28 | 3 | 736.520 | |
| | PC-11 | 4 | 477.920 | |
| | PC- 3 | 5 | 395.078 | |
| | PD-17 | 6 | 385.280 | |
| | PD-13 | 7 | 337.622 | |
| | PC-24 | 8 | 291.584 | |
| | PD-25 | 9 | 288.446 | |
| | PC-23 | 10 | 272.576 | |
| | PC-21 | 11 | 271.048 | |
| | PC- 9 | 12 | 245.408 | |
| | PC-27 | 13 | 173.202 | |
| | PC- 8 | 14 | 155.464 | |
| | PC-18 | 15 | | 3.262 |
| | PC-16 | 16 | | 127.894 |
| | PC- 4 | 17 | | 130.890 |
| | PC-12 | 18 | | 335.886 |
| GROUP D | PD- 9 | 9 | 712.530 | |
| | PD- 1 | 10 | 670.320 | |
| | PD- 3 | 11 | 645.498 | |
| | PD-27 | 12 | 615.630 | |
| | PD- 6 | 13 | 519.562 | |
| | PD-26 | 14 | 430.114 | |
| | PD- 7 | 15 | 317.520 | |
| | PD-14 | 16 | 71.272 | |
| | PD-20 | 17 | | 300.440 |
| | PC-13 | 18 | | 557.482 |
| | PD- 8 | 19 | | 609.566 |
| | PD- 2 | 20 | | 1,603.168 |

No. January Report: PA-7, PA-9, PA-14; PB-8, PB-10, PB-16, PB-17, PB-18; PC-19, PC-20, PC-25, PC-26; PD-11, PD-12, PD-29; RC-3, RC-4, RC-5; RD-8.

No December or January Report: PC-14, PC-15.

Withdrawn: PA-10; PB-12; PC-5, PC-17; PD-21, PD-22, PD-23; RA-1.

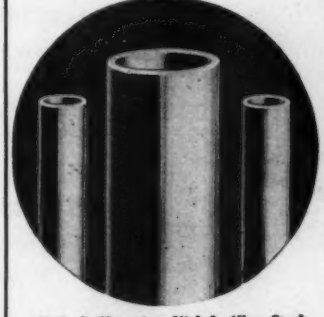
## ◆ National First Aid Week

An editorial in the March issue of *National Safety News* calls attention to National First Aid Week which has bee announced for March 11 to 17 by the National Association of Retail Druggists. Attention is drawn to the enormous cost of neglect, and the fact that industry and the individual will profit even more than the manufacturers and retailers of pharmaceuticals from more careful attention to the minor injuries which do not seem sufficiently serious to demand medical treatment. Even though mills are not enrolled in the Safety Contest, National First Aid Week is an especially good time to check up on what is being done in accident prevention.


AMERICA'S PREFERRED TUBING for Pulp and Paper Manufacture

*Produced by the largest manufacturer of tubular products in the world*

NATIONAL U S S 18-8 Stainless and Heat Resisting Pipe and Tubes are especially recommended for digester relief lines, heater coils, pulp stock lines, bleaching tank piping, and similar services where corrosion of equipment or discoloration of product leads to excessive operating or maintenance costs. They are highly resistant to corrosion by sulphate and sulphate pulping liquors, bleaches and similar paper-making chemicals; they are exceptionally ductile and have twice the strength of ordinary steel. Being seamless, NATIONAL U S S 18-8 Stainless and Heat Resisting Pipe and Tubes have no welds—no uncertainty about full wall-strength. Easily machined, bent, welded, or otherwise fabricated. Available in a wide range of diameters, wall-thicknesses, lengths, and shapes. NATIONAL engineers and metallurgists will gladly aid in determining the most effective application of this material to specific needs.



*U S S Chromium-Nickel Alloy Steels are produced under the licenses of the Chemical Foundation, Inc., New York, and Fried. Krupp A. G. of Germany.*

NATIONAL TUBE COMPANY

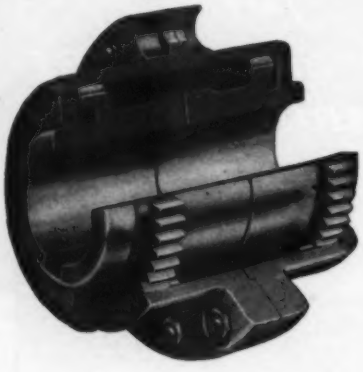
Subsidiary of United States Steel Corporation

PITTSBURGH, PA.

NATIONAL USS STAINLESS AND HEAT RESISTING PIPE AND TUBES

# POOLE

## PAPER AND PULP MILL EQUIPMENT



## FLEXIBLE COUPLINGS

The Poole flexible coupling combines great mechanical strength with an unusual capacity for adapting itself to ordinary shaft misalignments. It has no springs—rubber—pins—bushings—die castings or any flexing materials that require frequent replacement.

Using strong specially treated steel forgings, long wearing gears in constant bath of oil, this coupling eliminates your coupling troubles.

***Oil Tight—Dust Proof—Free End Float—Fully Lubricated***

***Send for a copy of our Flexible Coupling Handbook***

## G E A R S

**16000 DIFFERENT PATTERNS**

**ALL KINDS — TYPES — SIZES**

**MADE BY MACHINE MOULDED METHOD**
**Which Insures the Most Accurate**
**Cast Gears Made**

## REDUCTION GEARS

**THE POOLE GEAR CAN BE USED FOR EITHER INCREASING OR DECREASING SPEEDS**

**NEW DESIGNS—HERRINGBONE GEARS**
**ANTI-FRICTION BEARINGS**

**HIGHLY EFFICIENT**

**SEND FOR OUR CATALOG FULLY DESCRIBING**

## POOLE FOUNDRY & MACHINE CO.

**QUALITY [ SINCE 1843 ] SERVICE**

**WOODBERRY, BALTIMORE, MD.**

# TECHNICAL DEVELOPMENTS

**The following abstracts are of the latest developments found in the foreign press and in the patent offices. Photostats and translations of complete articles and patents can be obtained at cost price.**

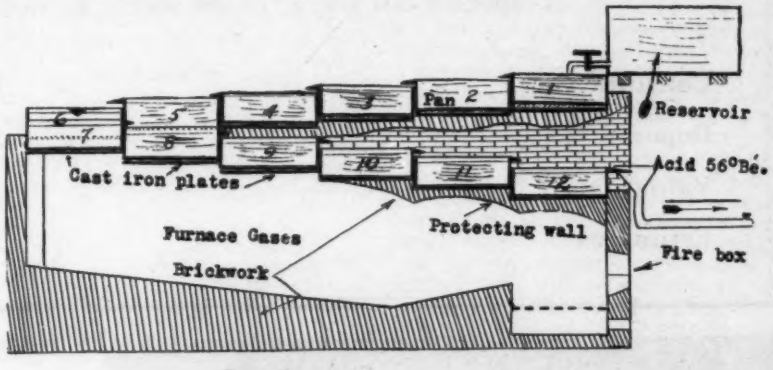
## IN THE PAPER INDUSTRY ■ DOMESTIC AND FOREIGN

### ◆ Influence of Fine Particles in Mechanical Pulp

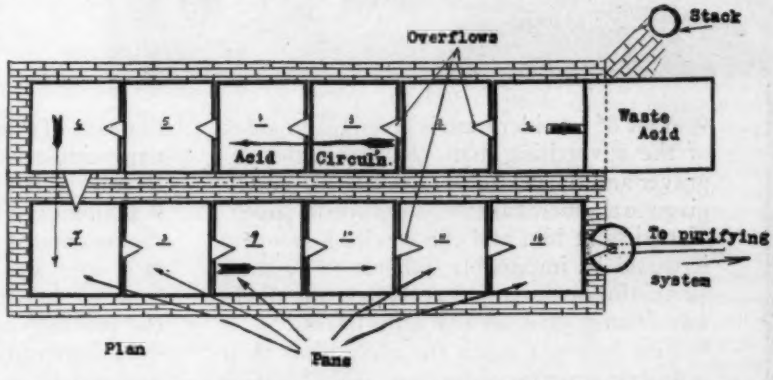
When to an unbeaten sulphite pulp of low initial tearing resistance mechanical pulp was added in gradually increasing amounts, the strength of the resulting sheet increased slightly at first. However, when the ratio of mechanical to chemical pulp exceeded 1:1, the tearing strength rapidly waned, and this decrease was markedly influenced by the percentage of wood flour in the original mechanical pulp. The lower the percentage of fine particles the greater the decrease in strength. When the original chemical pulp is well beaten, however, any addition of mechanical pulp greater than 10 per cent of the total causes a rapid decrease in strength, although here, too, the rate of decrease is greater, the lower the percentage of wood flour present. These findings are for sheets that were air-dried. In general, by running the sheets over a drying cylinder, the tearing strength is markedly decreased by mechanical pulp addition (usually 10-40 per cent) unless the original sulphite was highly hydrated. In the latter case, a very slight increase in strength was noted, up to a 40 per cent addition of mechanical pulp. Qualitatively, a similar picture obtains with regard to bursting strength, except that when well hydrated stock is used, any addition of mechanical pulp serves to lower the strength of the sheet. Only with unbeaten sulphite is there any increase in strength. The change in weight per unit volume is also directly correlated with the amount of mechanical pulp added. The greater the original hydration of the chemical pulp the more rapidly does the addition of ground wood lower the weight of a cubic meter, and here, too, this rate of decrease is influenced by the amount of fine particles in the mechanical pulp. The less there is of this component, the more rapidly does the decrease take place. The authors have made a painstaking quantitative study, changing such factors as the percentage of mechanical pulp, of wood flour, of sulphite pulp as well as degree of beating. Their results are fully tabulated and also expressed graphically. In general, the most valuable portion of the mechanical pulp from the standpoint of strength of the dried sheet consists of the finer particles, which possess adhesive properties that become most apparent when unbeaten sulphite is used. E. Meister and G. Foeth; Wochbl. Papierfabr., 64, No. 49,885; No. 51,921 (Dec., 1933).

### ◆ Concentration of Acid Liquors After Parchmentizing Paper

Depending on the type of operation, the residual sulphuric acid, after parchmentizing blotting paper, varies from 20-29 deg. Bé. (i. e. 27.3-36.8 per cent $H_2SO_4$), and contains hydrolyzed and carbonized organic matter. The recovery of this acid is economic if the density does not drop below 28 deg. Bé. The waste liquor is stored in a lead-lined reservoir capable of holding a day's output. This container is mounted on wooden blocks on a reinforced concrete platform, 5-6 meters above the ground. The first of a series of 12 rectangular evaporating pans is placed about 10-15 cm. below the outlet of the reservoir, so that it may be filled by gravity from a cock or a regulated siphon. The stepwise or amphitheatre arrangement of the 12 pans above the heating furnace is shown in the illustrations. The bottom of each pan is protected against overheating by resting on a layer of sand, 10-15 mm. in thickness, supported on a cast-iron plate, and may or may not be further shielded (depending upon its distance from the hottest part of the furnace) by layers of fire-brick. There is an overflow between each pan and its neighbor. Coal is used in firing (excepting in test runs, when wood is used as fuel). The author advises a series of upright lead baffles in the pans so as to increase the heating surface and expidite evaporation. However, as yet such baffles have not been generally adopted. The firing of the furnace and the rate of evaporation are so controlled that when the concentrated acid leaves the last evaporating pan, its density is 55.5-56 deg. Bé. Between this last pan and its overflow, it is expedient to place a small lead container provided with a vertical partition so that the density and temperature of the acid may be determined at any time during the evaporation. The rate of flow from the reservoir is so regulated that it just compensates for the evaporation. In practice, there should be a rapid rise in temperature between pan 1 and pan 4. Vigorous boiling (110-115 deg. C.) takes place in pans 5, 6, 7 and 8, and the density of the acid rises from 29 to 48 deg. Bé. In pans 9-12, the evaporation takes place steadily and the concentrated acid leaves the final pan at about 145 deg. C. Thence the hot acid is conveyed to a purification system compris-




Elevation




Plan

Pans

# GEORGE F. HARDY

## *Consulting Engineer*

**305-309 Broadway, New York City, N. Y.**

▼▼▼

MEMBER—AM. SOC. C. E.—AM. SOC. M. E.—ENG. INST. CAN.

**Consultation**
**Reports**
**Valuations**
**Estimates**

**Paper and Pulp Mills**
**Hydro-Electric and**
**Steam Power Plants**
**Plans and Specifications**

# The Unseen Man

*—yet present while they plan their advertising campaign!*

o A lot of consideration is given to the work of the advertising man, the artist, the engraver and the printer. How often is thought given to the merchant who supplies the paper? Yet without him and the service he renders it would be impossibly difficult to produce successful campaigns that include any direct advertising, or even any sales letters.

o Few men can make the claim that their industry contributes to every other business in the community. The printer can say this: So can the paper merchant. It would pay them to say it more often and say it together. For each of them can help the other. And the paper mill can help both of them to achieve a broader recognition of the value of their work.

o Hammermill is proud to be associated with the merchants who are agents for Hammermill lines and through them to serve the printing industry in greater measure than is the privilege of any paper mill in the world.

o Hammermill advertising, whether in a national magazine or a sample book, aims to cooperate with the printer and the paper merchant and to give full credit to the service they render.

**HAMMERMILL PAPER COMPANY, Erie, Penna.**

ing a series of lead pans connected by siphons, in which small amounts of potassium permanganate serve to oxidize the carbon to carbon dioxide, thus decolorizing the dark acid. This oxidation normally requires from 0.1-0.18 per cent permanganate (based on the weight of the acid). It is carried out empirically by a skilled workman, who stirs the oxidizing agent into solution by means of a lead covered wooden paddle and compares the color with that of a standard acid. Following this, the acid is allowed to deposit any sediment in the adjoining series of pans, and is subsequently raised by means of compressed air or a Wessling pump into a suitable storage tank. A plant having an output of parchment paper not exceeding 1500 kilos per day (i. e. one and two thirds tons) requires only one skilled laborer to run the recovery system. "G. M." *Papeterie*, 55, No. 24, 1282-89 (1933); 56, No. 1, 2-6 (1934).

## ◆ Process for Sulphite Digestion

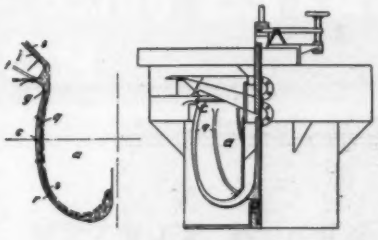
The method which is to be used in stationary digesters has as its objective the use of smaller amounts of liquor than are usually required in the sulphite cook. The claim is that only 5-7 cubic meters of liquor per ton of pulp are required instead of the usual 10 cubic meters, that the cooking period is shortened, the heat requirements lowered, and the product of a more uniform quality. To the fully charged digester is added a liquor containing the necessary bases, as the sulphites, in amounts so regulated as to convert the encrusting substances of the wood (on warming) into the corresponding lignosulphonates. This initial stage is followed by a withdrawal of ⅔ to ¾ of the original amount of liquor. (Although no specific statement is made in the patent abstract, the presumption is that this withdrawn liquor may be utilized further—Translator). This is followed by the addition of fresh liquor containing the requisite amount of free $SO_2$ but the volume of this liquor is only ¼ to ⅓ of that ordinarily employed in the average sulphite cook. The digestion is then continued until the delignification is complete. The liquors are withdrawn at the bottom and added at the top of the digesters. Patentaktiebolaget Gröndel-Ramén, Stockholm. Swedish Patent No. 77,429.

## ◆ Production of Halfstuff

Waste sulphite liquor is neutralized and rendered alkaline by means of lime, without removing organic matter. Certain salts like sodium ammonium sulphite, sodium sulphate, alkali salts of organic acids, etc., may or may not be added, according to conditions. This modified liquor is then used in the digestion of straws or grasses, which is carried out until the reaction is acid. Pulp obtained in this way may be used in the manufacture of kraft papers and cardboard. The presence of certain organic substances, which may be caramelized or in suspension in the liquor serve as sizing agents in later operations. An example of halfstuff production follows: 1000 kg. of chopped straw and 2500 liters of mixed liquor (essentially waste sulphite liquor, treated with 20 kg. slaked lime, with or without the addition of other salts) are heated under pressure for several hours in a vertical or rotary digester until an acid reaction sets in. The gases are vented, and the digester is blown. The product which is worked up directly without washing, into paper and cardboard, has approximately the same weight as the fibrous raw material used. Dr.-Ing. Ernst Strupp, Munich; German Patent No. 588,577, K1.55b.

## ◆ Purification During the Rinsing Process

The equipment applies especially to pulp. The outer boundary of a drum (a) revolving about a vertical central axis is double paraboloid in form. During its operation, a narrow circular slit (t) formed at the top (as explained below) serves for the continuous removal of particles of dirt at the surface of the liquid. The drum widens in shape from the bottom to the point (c), forming, in section, a parabolic curve. At this point, the boundary line of the drum curves in the opposite direction causing



a constriction in volume up to the point (g), where another marked widening occurs. Above the drum is a revolving ring, wider above than below, which may be raised or lowered at will during the operation, thus allowing for the formation of the slit (t) between the drum and the ring. Ribs (q) are attached to the inner surface of (a). The object of the invention is to remove floating particles from the surface of substances that are in process of washing. Maschinenfabrik zum Bruderhaus and Dipl.-Ing. Willy Wamser, Reutlingen, Württemberg. German Patent No. 583,551, K1. 55d.

## ◆ Humidity and Temperature Effects on Strength and Elasticity

By the extensive use of photomicrographs, the structure of unsized papers of various degrees of heating has been studied. Examination of sections indicates that the structure is not felted. It leads to the conclusion that in general paper fibers in the sheet are laid or laminated, one above the other, and that the layers run parallel to the surface of the sheet. Folding a sheet causes its separation into fiber flakes or layers, in each of which the individual fibers still adhere strongly to each other. These fiber flakes seem to be present already in the pulp suspension, giving rise to the hypothesis that the adhesion between the fibers in a flake is greater than the forces holding the flakes to each other. As the moisture content of a paper decreases, the place at which a break occurs shows less and less a separation of the fibers, and more generally the phenomenon of individual broken fibers until the separation ceases entirely. This is believed to be due to friction between the fibers, coupled with a weakening of the adhesive forces holding together individual micelles (the structural units of which the fiber is composed), and of the forces that bind the fibers to each other within each flake. The fact that when paper is heated in a high vacuum, at 125-50 deg. C., there is no observable chemical change, and no change in X-ray diagrams supports the existence of such surface forces. In 1929, Mörch advanced the hypothesis that the strength of paper was correlated with electrical forces. For example, when a sheet was introduced into toluene (dielectric constant 2.0) in place of water (dielectric constant 80), cohesive forces between the individual fibers disappeared almost completely. Such paper has lost practically all its strength. The microscopic examination of fiber surfaces does not always furnish clear evidence regarding the possible strength. In general, strength rose with temperature up to 50 deg. C., and decreased past this point. If the temperature was kept constant at 20 deg., the maximum strength was reached between a moisture content of 1 and 2 per cent. The reversible stretch of a paper held at constant temperature (i. e. its elasticity) appears to be independent of the moisture content, between certain, rather wide limits. A load far below that causing rupture, already gives rise to a permanent (irreversible) stretch, which appears to be due to the slippage *(Schlupf)* between the fibers or between the micelles. Photomicrographs indicate that a paper shows only the fiber slippage, if it retains more than 5 per cent of water. Somewhere between a 5 per cent and 0.5 per cent of water content in the sheet, a clean-cut rupture of the individual fibers takes place. This means that a slippage between the micelles has occurred. From that point on, the forces holding together the micelles within a fiber are no greater than those binding the fibers to each other. This leveling of adhesive forces is ascribed to the fact that water layers obtaining between neighboring micelles have the same thickness as have the water layers between neighboring fibers. As long as the only slippage is that between the fibers, elasticity curves show a constant elasticity. As soon, however, as fiber rupture is noted, there is a concomitant decrease in elasticity. Between 100-150 deg. C., there is evidence of definite slippage between the micelles. A complete destruction of individual micelles is correlated with further decrease in elasticity. Paper that has been dried

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for long time periods at 100 deg. C. is no longer capable of regaining all the water lost, and there are also irreversible changes in strength, indicating the relationship between strength and the capacity for the retention of a definite per cent of water, which is naturally lowered by extensive heating. A series of curves show the strength and elasticity variations to which individual papers are subjected under specific temperature and moisture conditions. Loosely bound water, in thin layers, apparently surfaces each fiber and each micelle, so that no two fibers and no two micelles in a sheet of paper are in actual contact. This intervening water film serves as carrier of the adhesive forces between one fiber (or micelle) and its neighbor. Differences in the strength of a paper may thus be correlated with the thickness of this water film. Apparently electrical and not crystallographic forces are involved. The latter are only manifest within the individual micelles, and are protected from without by electrical surface potentials. (The original article has 21 illustrations.) A Basberg; Papir J. (Norway) 21, 103-5, 114-7, 123-6, 136-9 (1933); through Papier-Fabr. 32, No. 1, 8-9 (Jan. 7, 1934).

### ◆ Effect of Waste Liquors on Fish Life

The deleterious effects of wastes are discussed and one case in particular is described in some detail. In this case the liquors from a sulphate mill proved damaging to the salmon industry. Here the most serious ingredient appeared to be the resin soap formed during the cook. A method was devised for detecting and roughly determining very small amounts of this material. It depends on a strong, fairly persistent violet coloration produced by the interaction of rosin and chlorosulphonic acid. F. W. Klingstedt; Pappers-Trävarutid Finland, 15,616 (1933); through Papier-Fabr. 32, No. 3,33 (1934).

### ◆ White Mechanical Pulp

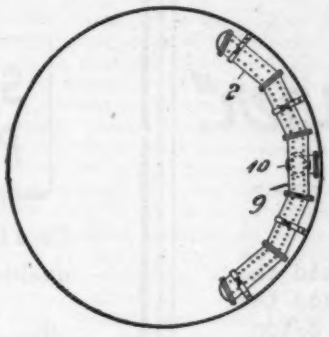
After spruce or other woods high in resin content have been ground and the pulp thickened, the material is treated directly with a solvent for the removal of rosin and resinous substances. Care during the wet grinding prevents the loss of turpentine and obviates the oxidation of resinous substances in the wood. Harald Jensen, of Vindern near Oslo, and Johan Björn Raeder, Holmenkollen, near Oslo. German Patent No. 586,559, K1.55a.

### ◆ Calcium Sulphate Free From Alkali

Gypsum overburned in a blast furnace is stirred then thoroughly leached with water, and sharply neutralized with dilute sulphuric acid. The neutral material is especially serviceable in the paper industry. It facilitates sizing and prevents brittleness in paper. Willy Larson and Gustav Mosebach, Harz. German Patent No. 505,240, K1.55c.

### ◆ Screen for Liquor Removal in Pulp Digesters

The equipment for liquor removal consists of a tube (9) attached horizontally to the inner circumference (1) of the digester; (9) being made up of a convenient number of sections of per-




forated straight tubes (2), connected with each other at obtuse angles, making it possible to construct the screen from rectangular plates such as those obtained from rolling mills. Aktiebolaget Nordiska Armaturfabrikerna, Stockholm. German Patent No. 586,701, K1. 55b.

### ◆ Solid Lignosulphonic Acid and Its Removal from Pulp

Dr. C. Kullgren emphasizes the permutite character which the so-called solid or residual lignosulphonic acid imparts to sulphite pulps and outlines a method for the determination of this lignin residue, the principle of which depends on an exchange of ions and on the assumption that the lignin has reached a definite uniform degree of sulphonation. In this determination, the calcium-ion bound to the lignosulphonic acid in the pulp is leached out by means of an acid. In other words, the hydrogen-ion takes the place of the calcium. The pulp is then washed with pure, cold water until neutral, and immersed in pure, Normal sodium chloride solution. Again there is an exchange of ions, the sodium entering the place of the hydrogen in the lignosulphonic acid residue. The remaining sodium chloride solution naturally becomes acid, due to this exchange, and the acidity which is titrated is a measure of the lignosulphonate remaining in the pulp. The properties of solid lignosulphonic acid are interesting and of marked practical significance. If pulp containing this substance (in which the calcium has been replaced by hydrogen) is washed with cold water and dried, the product is grayish and shows little strength. If, however, this same material is washed with a sodium chloride solution prior to drying, the darkening, degradation and weakening of the product are entirely prevented. The following quantitative experiment is characteristic: A pulp high in residual calcium lignosulphonate was treated with 0.2 Normal hydrochloric acid and was washed with cold water. The solid lignosulphonic acid then became readily soluble in 0.004 Normal hydrochloric acid at 78 deg. C., or even in water at that temperature. However, it was practically insoluble at 78 deg. C. in a mixture of 0.004 Normal hydrochloric acid and 0.05 Normal sodium chloride. This striking modification depends on the exchange of hydrogen-and sodium-ions, the latter forming a practically insoluble lignosulphonate that is tenaciously retained by the fiber and which causes no hydrolytic destruction of the cellulose.

A pulp containing free, solid lignosulphonic acid also caused the inversion of pure sucrose solutions at 50 deg. C. Since the lignosulphonic acid radicle is only slightly soluble at this temperature, the sucrose hydrolysis depends on a distribution of the hydrogen-ions between the water and the pulp.

Kullgren explains the probable mechanism of the delignification of wood during a sulphite cook somewhat as follows: During the first part of the digestion, the lignin is sulphonated, binding largely calcium-ion and to a much lesser extent, hydrogen-ion. The ratio of calcium to hydrogen-ion in the solid phase depends upon the composition of the cooking liquor. As the digestion proceeds, the free solid lignosulphonic acid (i. e., that binding the hydrogen-ion) is leached out. A new equilibrium is gradually set up between the cooking liquor and the ions held by the lignosulphonate in the wood, so that progressively an ever decreasing portion of hydrogen-ion is taken up by the pulp, followed, of course, by the solution of the resulting free solid acid. If the metallic-ion is completely replaced by hydrogen-ion, hot water alone serves to dissolve the solid ligno-sulphonic acid. If such an exchange is not made, even a thorough washing will not remove the metal-ion from the pulp. If free solid lignosulphonic acid is present and is leached out with hot water, very small amounts of carbohydrate are removed. In other words, the residual pulp is high in hemicelluloses which have evidently been well protected during the digestion. There appear to be two possible explanations for the effect of cation exchange during a sulphite cook: (1) the solid lignosulphonic acid, due to its hydrogen-ion content works directly as a catalyst in causing a fission of the lignin-carbohydrate complex in wood, or (2) the strongly acid grouping developed when hydrogen-ion replaces calcium-ion indirectly affects and activates that group in the wood which binds the polysaccharide, causing a hydrolysis, without, however, exerting the catalytic influence of the hydrogen-ion. Kullgren, opposing the general views of Hägglund, favors the second hypothesis, claiming that the hydrogen-ions of the cooking acid considered apart have little or no effect on delignification. Only when correlated with the metallic-ion concentration, has the hydrogen-ion concentration any true significance. Carl Kullgren; Svensk Pappers-Tidn., 36, No. 14/15, 499 (1933); Papier-Fabr. 32, No. 1, 2-6 (1934).

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# The COMMERCIAL OUTLOOK

New York, March 1, 1934.

SIGNIFICANT indeed was the pronounced and almost unanimous confidence expressed by the horde of paper manufacturers who flocked to New York last week to attend their annual trade convention. This feeling of assurance is based on events of recent months and indications of what is to come. Business in paper is much improved over that seen not so long ago. While there is much room for additional expansion of demand from consuming quarters and in manufacturing activity within the industry, and while over the holiday and inventory period at the turn of the year the paper market quieted substantially, even at the worst the industry was in a far better condition than at the same season a year ago. Moreover, the trend now is forward; on various sides are signs of increasing consumption of and demand for paper of practcally all kinds; stocks accumulated during the buying surge of last summer have been gradually worked off in numerous cases and consumers and converters are finding it necessary to re-enter the market to replenish supplies, and mills making virtually all classes of paper and board are again encountering a widening demand.

True enough, the actual expansion in paper business during the first two months of the new year has been comparatively narrow. There has been, of course, the usual normal pick-up following the dullness of the holiday period, but otherwise demand has not broadened to any great extent. The encouraging feature at present is the very favorable prospects in view. There seems every reason to believe activity in the paper industry will reach the lengths of last summer, and probably go further, within the next several months. Current operations of paper mills of the country, as brought out at the recent papermakers' convention, are approximately 65 per cent of productive capacity—taking all mills as a single unit. This leaves 35 per cent of mill equipment idle, and yet this does not mean that paper manufacturing activity is this much below normal, because rarely do the nation's paper mills, even in busy periods, operate at more than about 85 to 90 per cent of capacity basis. Nor does it mean that all mills are running only at about 65 per cent of their capacity; as a matter of fact, demand for some kinds of paper is voluminous enough to keep mills producing up around 85 or 90 per cent, and even at full capacity, whereas other types of the industry's product are experiencing quiet market conditions and mills making such paper are producing at only approximately 50 per cent or less.

Probably the most important recent development in the general business situation is the sharp increase in retail trade reported in many sections of the United States. Department store sales in the metropolitan New York area, for example, showed a 15 per cent gain during the first half of February, following a 12 per cent or thereabouts increase in January. Reports from the South and also the Middle West tell of marked expansion in retail business. Nothing could be more favorable for the paper trade, as gains in the retail movement of merchandise mean proportionate increase in consumption of various kinds of paper—wrapping, tissue, writing, board and others.

Also, statistics and other indicators show that general business in manufacturing, distribution and other lines is forging ahead, making steady gains in a more gradual or conservative manner than was the case during the spurt of last summer, yet registering consistent and healthy improvement. Consumption of paper is keeping pace with this general industrial and trade improvement, and that paper manufacturers will soon feel this stimulus seems only a matter of a short interval.

Paper production in the United States during the calendar year 1933 is authoritatively estimated to have totaled 8,893,000 net tons of all grades, compared with a total in 1932 of 7,997,872 tons as reported by the U. S. Department of Commerce, an increase last year over the preceding year of approximately 11.2 per cent. The output in 1933 was divided 977,000 tons of newsprint, compared with 1,047,047 tons in 1932; 1,032,000 tons of book paper, against 945,936 tons; 3,723,000 tons of boards, against 3,303,371 tons; 1,418,500 tons of wrapping, against 1,244,443 tons; 523,000 tons of writing, against 424,298 tons; 464,000 tons of tissue, against 358,645 tons; 16,500 tons of cover, against 14,467 tons; 62,000 tons of hanging, against 60,661 tons; 319,000 tons of building, against 293,549 tons, and 358,000 tons of miscellaneous grades, contrasted with 183,092 tons in 1932.

Production of newsprint in the United States and Canada during January was 26 per cent greater than in the similar month of 1933, with Canadian mills showing the greater increase. Shipments from mills were approximately the same as production, so that stocks of newsprint at mills remained virtually unchanged at less than one-fifth of a month's output, according to figures compiled by the News Service Bureau.

Newsprint production in the United States reached 84,194 tons in January, compared with 80,895 tons in the month preceding and 74,444 tons in the same month a year ago. Canadian mills produced 188,374 tons in January, against 175,304 tons in December last and 140,539 tons in January, 1933. Total North American output during January was 299,278 net tons, contrasted with 283,833 tons in the preceding month and 238,598 tons in the corresponding month last year. Shipments from U. S. mills totaled 84,796 tons in January and from Canadian mills 187,352 tons, a total of 272,148 tons, compared with 254,316 tons in December last and 205,781 tons in January, 1933. Mill stocks of newsprint at the end of January aggregated 52,495 tons at both U. S. and Canadian mills, against 52,413 tons a month earlier and 73,339 tons a year ago.

Under code arrangements, prices of paper are quite steady. Minimum bases have been established in most divisions of the trade, and manufacturers and distributors are reported adhering steadfastly to the prices quoted. Consumers and converters, evidently coming to realize they cannot break through the market levels established, are meeting quotations with less resistance. Not in a lengthy time has a more stable price situation been witnessed in the paper industry.

❖ ❖ ❖

## ◆ U. S. Pulp Imports

| | Long Tons |
|---|---|
| **1933** | |
| Bleached Sulphite | 400,633 |
| Unbleached Sulphite | 643,003 |
| Kraft | 461,980 |
| Ground Wood | 187,750 |
| **1932** | |
| Bleached Sulphite | 311,046 |
| Unbleached Sulphite | 508,088 |
| Kraft | 310,659 |
| Ground Wood | 168,272 |
| **1931** | |
| Bleached Sulphite | 319,518 |
| Unbleached Sulphite | 540,478 |
| Kraft | 344,612 |
| Ground Wood | 188,086 |
| **1930** | |
| Bleached Sulphite | 322,886 |
| Unbleached Sulphite | 655,049 |
| Kraft | 357,551 |
| Ground Wood | 267,193 |
| **1929** | |
| Bleached Sulphite | 334,235 |
| Unbleached Sulphite | 701,456 |
| Kraft | 384,005 |
| Ground Wood | 244,162 |
| **1928** | |
| Bleached Sulphite | 307,926 |
| Unbleached Sulphite | 640,660 |
| Kraft | 381,256 |
| Ground Wood | 222,499 |

From—*Daily Mill Stock Reporter*

# FIFTY YEARS

1884 1934

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• • • •

ALONG with this, it is, as it always has been, the determination of this company to carry into constant practice in all of its dealings, those high principles which have been fostered by the American Paper and Pulp Association and the National Paper Trade Association since their inception many years ago.

*"MAKERS OF PAPERS OF STRENGTH"*

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Fine Faced "English Woven" Felts for Fine Papers
in Three, Four, Five and Six Ply 60 Inches
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**Absolutely No Felt Marks in Paper**

TRIUNE Three Ply Felts for extra long service and large production

# Domestic RAW MATERIALS

## ◆ Papermaking Rags

A distinctly upward tendency is noticeable in many descriptions of papermaking material, and price advances of fair dimension have been scored in some grades. Dealers and importers stress the bullishness of the supply situation, and assert that the strengthening of market values is due as much to this factor as to the demand emanating from consuming quarters.

In papermaking rags, the various grades of new cotton cuttings are in more call and very firmly quoted, some at new high levels for the present forward surge of the market, while roofing rags are selling freely and at firm to rising prices. Fine paper manufacturers evince broader interest in cotton cuttings and in some cases have increased their purchases fairly substantially; moreover, they have paid higher prices, evidently being obliged to in order to procure the supplies desired. Reports tell of No. 1 new white shirt cuttings having brought 7.50 cents a pound delivered mills in the New England district, although at the moment this appears to be the upper edge of the price range, with mills succeeding in getting some white shirt cuttings at slightly less. New soft unbleached muslins are reported selling at around 7.75 cents per pound f.o.b. dealers' shipping points in the East, light silesias 4.50 cents, blue overall cuttings 4.50 cents, mixed khaki cuttings 3.75 cents, black silesias 3.50 cents, fancy shirt cuttings 2.50 cents, and washables 2 cents. New linen cuttings are quoted strongly, most dealers wanting at least 10.50 cents a pound at shipping points for white, and 8.50 cents for grey linen.

The run of felt mill demand on roofing rags has been for No. 1 classification roofing stock, and reports say that sales have been made in the East at 1.30 cents per pound f.o.b. shipping points for cloth strippings and other No. 1 roofing, while No. 2 stock is bringing 80 cents per hundred pounds and perhaps a little higher in exceptional instances. The sharp rise in mixed woolens rags is part accountable for the advance in No. 1 roofing stock, since cloth strippings are derived from old woolen rough cloth. This mixed material only recently sold at 2.25 cents a pound; now the price level is all of 3.50 cents or more.

Paper manufacturers continue to buy old white cottons and blue cottons in very reserved volume while seemingly using comparatively few of these rags. However, there is a fair export movement of old whites, and this, together with the rise in roofing stock, is serving to push market prices on these rags upward. Dealers as a rule ask at least 2.75 cents a pound at shipping points for No. 1 repacked old whites, 2 cents for No. 2 repacked whites, and 1.50 cents for repacked thirds and blues, and higher quotations frequently are named.

Due in good part to high exchange, most papermaking rags of foreign origin are quoted above a parity with prevailing market levels here, and importers assert it is difficult for them to buy abroad profitably. In certain grades, the trend in the movement of supplies is from the United States to Europe.

## ◆ Old Paper

Fair advances have been scored in prices of some lines of old paper—mostly the low grades—both in the East and the Middle West, and the market as a whole displays firmness and a rising trend. Mixed paper recently moved up $2 a ton, East and West, and folded news advanced $2 in the West. Ledger stock is very firm, as are white shavings, kraft grades and book stock. The market basis in the West on No. 1 mixed paper is 50 cents per hundred pounds f.o.b. Chicago, and in the East 35 to 40 cents at shipping points, while folded news is 70 cents in the West and 50 to 55 cents in the East. Heavy No. 1 old books and magazines are selling at 90 cents or higher at dealers' points in the East, crumpled book stock at 80 cents, and No. 1 old kraft at 1.20 and 1.25 cents a pound. Kraft grades are especially strong in price, new kraft cuttings quoted at up around 1.75 cents per pound, and kraft corrugated cuttings at 1.35 cents. Sales of No. 1 hard white envelope cuttings have been recorded in the East at 2.65 cents a pound at shipping points, No. 1 hard white shavings at 2.40 cents, No. 1 soft white shavings at 2.10 cents, and extra soft white of one-cut variety at 2.30 cents.

## ◆ Chemical Pulp

Perhaps the salient feature in the chemical woodpulp market is the firmness with which manufacturers are quoting their product and their seeming determination to secure the minimum basic prices established, more particularly as respects bleached sulphite. Demand is fair; while a majority of consumers are now depending more on supplies coming in against contracts, which apparently are filling their major needs, there is nevertheless a moderate current business transpiring, and most domestic pulp mills are well sold and are not over-eager for additional orders involving shipments for a time. Prime bleached sulphite is 2.75 to 2.90 cents a pound ex dock Atlantic seaboard basis, depending on the several grades, and some of the extra qualities are quoted at 3 cents and up to 3.25 cents. Unbleached sulphite prices start at 2.10 cents a pound ex dock and range up to 2.20 cents for ordinary prime grades, and 2.25 and 2.30 cents for easy bleach and Mitscherlich sulphites. Kraft pulp of domestic manufacture is quoted at 1.75 cents upward, with 2 cents and higher asked on some mill brands. Domestic bleached soda pulp continues to sell at 2.50 cents a pound delivered book paper mills.

Domestic production of woodpulp—mechanical and chemical—in the United States showed an increase of about 11 per cent during 1933 as compared with 1932, according to preliminary figures submitted by identical mills. The total output last year of all mills is estimated at 4,241,500 net tons, contrasted with the U. S. Department of Commerce figure of 3,760,267 tons in 1932.

## ◆ Mechanical Pulp

Groundwood prices exhibit a steady tone and are well maintained. Severe weather in many regions has created additional demand for spot supplies, and, in general, a fair tonnage movement into consuming channels is noted. Canadian groundwood is quoted around $22 a ton f.o.b. pulp mills across the border or on a range of $29 to $33 delivered consuming centers in upper New York State, depending on the haul from producing points, and grinders in the Dominion evince little or no disposition to shade prices. Such domestic groundwood as is selling in the open market is reported bringing about $27 a ton at pulp mills.

## ◆ Chemicals

Rosin prices have advanced, gum rosin now quoted at $5.75 to $6 per 280 pounds, in barrels, at works, and wood rosin at $4.80 per 280 pounds. Bleaching powder demand is reported fair and prices hold steady at 1.90 to 2.10 cents per pound for bleach in drums f.o.b. works. Domestic casein is quoted at 12 cents a pound for the standard ground and 13 cents for finely ground, and at 15.50 to 16 cents for the imported article. Caustic soda and soda ash prices are maintained under a steady contract and spot movement of supplies.

## ◆ Rope and Bagging

There seems to be a fair call from paper mills for old bagging, whereas old rope remains in a quiet market position. Scarcity of scrap bagging, along with the demand from consuming quarters and comparatively high prices quoted from abroad, make for a firm price tone and it is doubted that strictly No. 1 scrap burlap can be bought under 1.10 cents a pound at shipping points, with most dealers and importers asking above this figure. Roofing bagging is reported bringing 70 cents per hundred pounds, and foreign material is said to be difficult to procure at this price level.

## ◆ Pulpwood

Prices of pulpwood are steady to firm and reports tell of a fairly good demand emanating from consuming centers. The contract movement is consistent, and pulpmakers are occasionally effecting additional purchases in the open market.

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*The Menasha Products Company • Menasha, Wis.*

# Import and Export MARKETS

## IMPORTS

### ◆ Wood Pulp

Statistics just released by the U. S. Department of Commerce divulge that a new high record of wood pulp importations into the United States was established during the calendar year 1933. A total of 1,733,744 long tons of pulp of all kinds, mechanical and chemical, was imported into this country last year, reaching an aggregate value of $57,399,010, according to the Government's official figures, showing a gain of 31 per cent over the 1,323,179 tons imported in 1932, having a value of $46,921,373, and also registering an increase over the 1,685,272 long tons of a declared value of $89,085,996 imported in 1929, which prior to last year had stood as the year of largest wood pulp imports.

Thus, after three consecutive years of declining pulp imports, 1933 witnessed a reversal of the trend, and receipts during the last twelvemonth from all sources rose to the highest level ever before reached. The big increase last year was due to the large rise in imports of chemical pulp, receipts of which totaled 1,545,994 long tons of a value of $54,184,091, representing a gain of 33 per cent over the 1,154,907 tons of a value of $43,652,916 imported in 1932.

Mechanical pulp imports in 1933 amounted to 187,750 long tons, valued at $3,214,919, a rise of 11 per cent from the 168,272 tons of a value of $3,268,457 in the preceding year. Imports of bleached sulphite from all sources during 1933 were 400,633 long tons, valued at $19,138,468, contrasted with 311,046 tons of a value of $14,727,214 in 1932, while imports of unbleached sulphite totaled 643,003 long tons of a value of $19,946,124, compared with 508,088 tons of a value of $17,047,669 in 1932, and receipts of unbleached sulphate or kraft pulp amounted to 461,980 long tons of a declared value of $12,568,367, against 310,659 tons at $9,818,674 in 1932.

Pulp imports into the United States from Sweden during the first eleven months of 1933 amounted to 713,792 long tons of chemical, valued at $21,316,147, and 12,159 long tons of mechanical of a value of $242,211, according to U. S. Department of Commerce figures. Imports from Canada reached a total of 438,334 long tons of all grades in the eleven-month period, valued at $16,440,511, and comprising 177,606 tons of bleached sulphite, valued at $9,194,342; 70,916 tons of unbleached sulphite, $2,208,859; 26,483 tons of unbleached kraft, $948,363; 136,614 tons of groundwood, $2,293,956, and 26,715 tons of miscellaneous pulps, valued at $1,794,991.

Imports from Finland in eleven months last year aggregated 189,648 long tons, valued at $5,867,239, consisting of 170,738 tons of chemical pulps of a value of $5,539,894, and 18,910 tons of mechanical of a value of $327,345. Norway supplied 95,663 long tons of all grades last year, valued at $3,377,718, comprising 90,106 tons of chemical of a value of $3,295,329, and 5,557 tons of groundwood, valued at $82,389.

Reports from some quarters of the trade tell of fair activity in imported wood pulp. Consumers in certain instances are said to be buying on a good scale, and a far ways ahead; in fact, up to the end of 1935. On the other hand, many paper and board manufacturers, apparently well stocked with pulp and having additional supplies on order, are remaining out of evidence as buyers. Market prices display firmness. The minimum prices established on sulphite are fully sustained, bleached sulphite at from 2.75 cents up to 3 cents and higher per pound, according to grade, ex dock Atlantic seaboard, and prime unbleached sulphite from 2.10 cents up to 2.30 cents, also according to grade.

### ◆ Paper

December receipts amounting in value to $7,081,375, comparing with $7,136,484 in the preceding month and $6,204,526 in December, 1932, brought the total value of imports of paper of all kinds into the United States during the calendar year 1933 up to $77,446,538, showing a sharp decrease from imports of a value of $94,089,418 in the twelve months of 1932, and a larger decline contrasted with the 1931 importations valued at $125,623,138, according to official U. S. Department of Commerce figures. Standard newsprint, to the value of $68,494,657, was imported last year, against $84,675,654 in 1932, while the next important class of paper imported was cigarette paper, imports of which reached a value of $3,426,325 in 1933, compared with $4,141,144 in the preceding year.

### ◆ Paper Stock

Importations of rags for papermaking into the United States during 1933 registered a sharp increase over the preceding year—very nearly doubling the quantity imported in 1932—and were also larger than the 1931 imports, though far below the totals of other previous years. Receipts last year amounted to 171,503,795 pounds, valued at $1,413,830, showing a 93 per cent rise in quantity over the 88,434,994 pounds of a declared value of $1,161,315 imported in 1932, and comparing with 116,680,789 pounds of a value of $1,571,148 in 1931, according to U. S. Department of Commerce statistics.

Imports of miscellaneous paper stock, comprising old bagging, old rope, waste paper, etc., in 1933 reached 105,046,100 pounds, valued at $1,153,925, contrasted with 84,970,166 pounds of a declared value of $781,356 in the preceding year, and 123,285,085 pounds of a value of $1,503,180 during 1931.

## EXPORTS

In point of total value, exports of paper and paper products from the United States during the calendar year 1933 came very close to equaling the 1932 exports. Since market prices were appreciably lower, on an average, last year, it seems safe to say that the volume of paper exportations in 1933 exceeded that of the preceding year; in fact, the figures covering the different grades of paper show in almost every instance an increase in quantity last year over the year before.

Total exports during 1933 reached a value of $14,599,007, according to U. S. Department of Commerce reports, compared with shipments of a value of $15,407,559 in 1932, and $22,419,743 in 1931. Exports of newsprint paper last year amounted to 22,296,879 pounds, valued at $456,808, against 16,927,992 pounds of a value of $447,896 in 1932. Export shipments of uncoated book paper totaled 18,382,509 pounds, valued at $862,848, against 14,963,103 pounds, valued at $787,094, in 1932; of writing paper, 13,526,825 pounds of a value of $884,430, against 12,529,315 pounds of a value of $859,236; of wrapping paper, 24,373,666 pounds of a value of $1,249,810, against 19,260,320 pounds of a value of $1,317,011; of tissue and crepe paper, 3,815,430 pounds of a value of $544,164, against 3,676,093 pounds of a value of $554,128; of blotting paper, 1,583,377 pounds of a value of $148,162, against 1,092,594 pounds of a value of $117,036, and of sheathing and building paper, 7,215,510 pounds of a value of $176,642, against 6,997,166 pounds of a value of $187,325.

Exports of boxboard totaled 44,632,705 pounds, valued at $946,289, in 1933, against 37,504,905 pounds of a value of $660,469 in 1932, and other paperboard shipments were 18,927,779 pounds of a value of $663,099, against 24,725,223 pounds of a value of $814,086. Paper bag exports last year were valued at $529,522, compared with $485,158 in 1932, while paper box and carton exports reached a vaule of $443,734, against $628,046.

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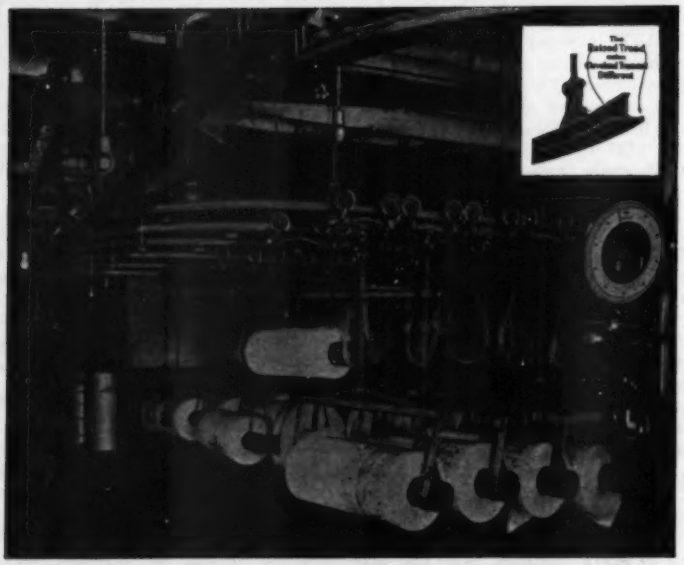

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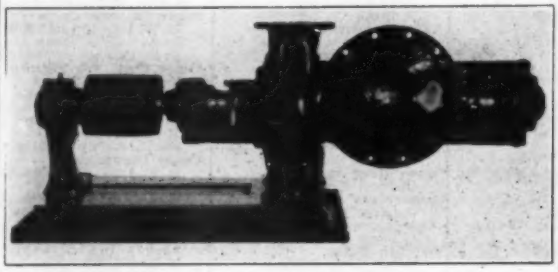

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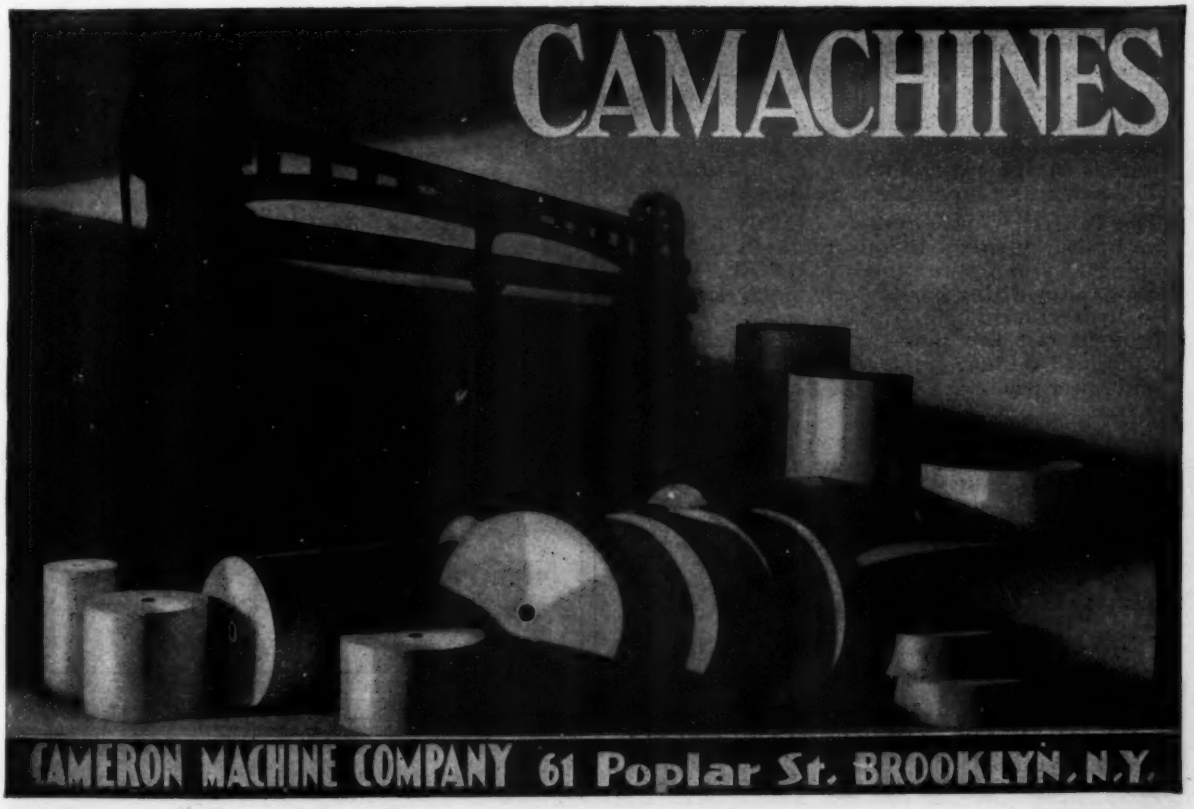

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